Appendix A Notice of Preparation and NOP Comments

Notice of Preparation

Notice of Preparation

To: State Clearinghouse
Responsible & Trustee Agencies
Interested Parties (Address)

From: Town of Loomis
P.O. Box1330
Loomis, CA 95650 (Address)

Subject: Notice of Preparation of a Draft Environmental Impact Report

The Town of Loomis will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☐ is ☒ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Bob King, Town Planner at the address shown above. We will need the name for a contact person in your agency.

Project Title: Costco Warehouse and Fuel Facility

Project Applicant, if any: Costco Wholesale

Date May 15, 2017

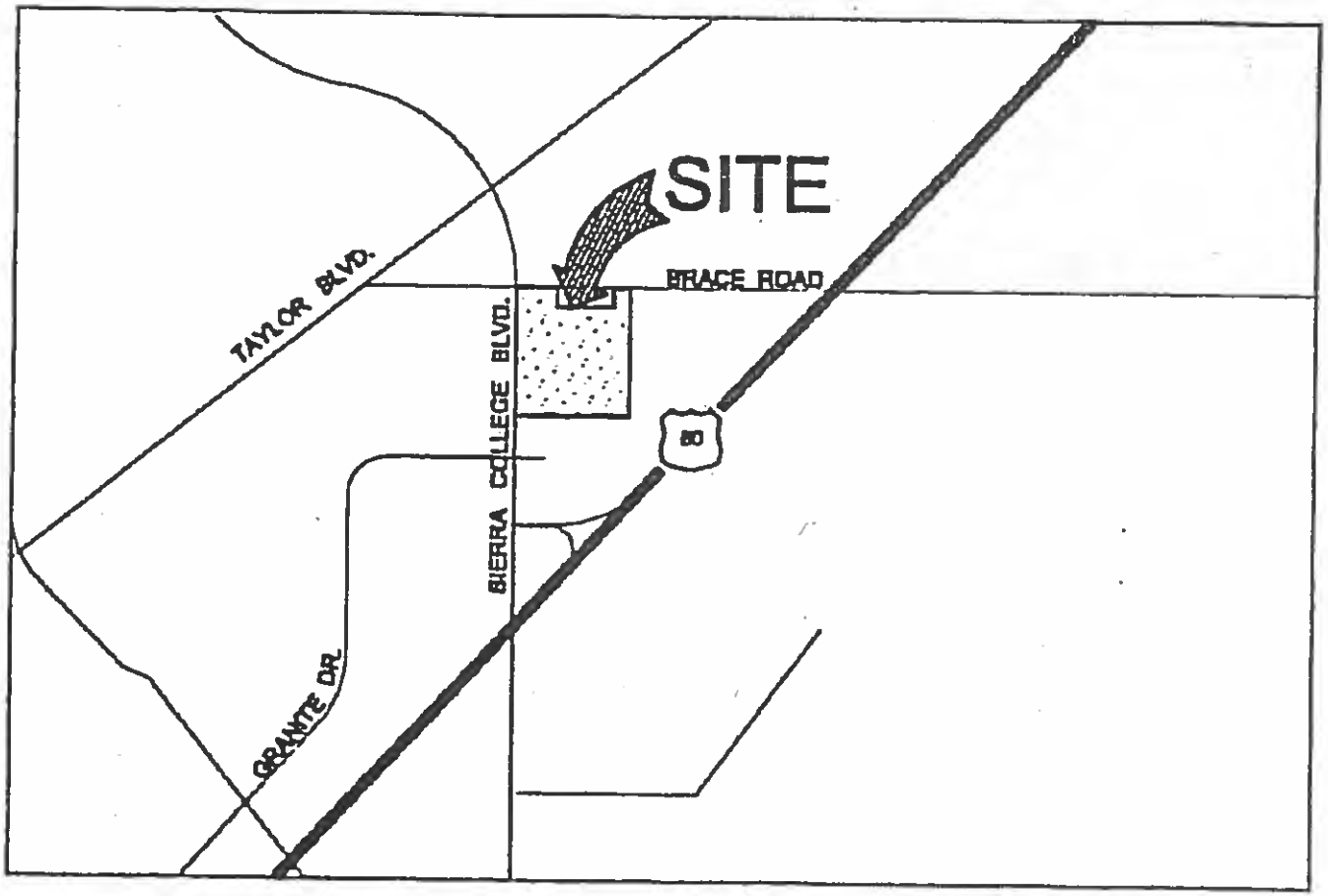
Signature John L. Phillips

Title Interim Town Manager

Telephone 916-652-1840

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

New Costco Warehouse and Fuel Facility
NEQ I-80 and Sierra College Blvd
Loomis, California



Vicinity Map

Scale: N.T.S.

Project Description

New Costco Warehouse and Fuel Facility
NEQ I-80 and Sierra College Blvd
Loomis, California

Applicant	**Costco Wholesale** **9 Corporate Park** **Suite 230** **Irvine, California 92606** **Attn: Michael Okuma** **(714) 978-5023**
Contact Person	**David Babcock & Associates** **3581 Mt. Diablo Blvd., Suite 235** **Lafayette, CA 94549** **Attn: Jeff Berberich** **(925) 283-5070**

Site Information

Project Location:	Sierra College Blvd at Brace Road Loomis, CA
Assessor Parcel Numbers:	045-042-034, 045-042-035, 045-042-036, 045-042-037, 045-042-011, 045-042-012.
Site Area:	± 17.38
Current Zoning:	CG General Commercial RM-5 Medium Density Residential
Current General Plan:	CG General Commercial RM-5 Medium Density Residential
Proposed Zoning:	CG General Commercial RM-5 Medium Density Residential
Proposed Use:	Warehouse Retail (CG)

Site Description

Project Proposal

The proposed project consists of the following components:

1. The following applications will be processed for the project with the Town of Loomis;
    a. Design review approval for the site plan, building design, and preliminary landscape plan;
    b. A Conditional Use Permit to approve the tire center and fuel facility uses;
    c. A Lot Line Adjustment and Reversion to Acreage to combine the six existing parcels into a single parcel;
    d. A Zoning Text Amendment to allow for the Costco warehouse in the CG, General Commercial Zoning District for this specific site;
    e. A General Plan Text Amendment to allow for the Costco warehouse in the CG, General Commercial General Plan designation for this specific site;
    f. An Environmental Impact Report to study the impacts and potential mitigation measures required for the project. The construction of a new approximately 152,101 square foot Costco Wholesale warehouse building with ±777 parking stalls and associated landscaping on a ± 17.38-acre parcel. In addition, the Costco project will include a 24-dispenser fuel facility with potential future expansion to 30 dispensers that will be analyzed and approved with the entitlements for the project.
2. Proposed uses will include, without limitation, warehouse retail, tire sales and installation, motor vehicle fuel sales including diesel, optical exams and optical sales, photo center and processing, hearing aid testing and sales, food service preparation and sales, meat preparation and sales, bakery and sales of baked goods, alcohol sales and tasting, and propane refueling and sales adjacent to tire sales and installation facility. Temporary outdoor sales within the parking field adjacent to the warehouse for seasonal sales, such as Christmas trees from late November through December.
3. Vehicle display at the Costco warehouse entry for on-line or off-site (referred) automobile sales.
4. Signage to include the Costco warehouse typical signage to be approved as part of the entitlement process.
5. The Costco warehouse parcel would be entitled and constructed in one phase.

<u>COSTCO PROJECT DESCRIPTION:</u>

Costco Employment

It is anticipated that the Loomis Costco warehouse and gas station will employ approximately 165 to 170 employees.

Costco Site/Landscape Plan

The warehouse is sited to minimize impacts to the existing residential neighborhood to the east and apartments to the north. The main entry feature has been oriented towards the existing residential so that the loading dock and truck deliveries are accessed and oriented towards Sierra College Blvd to further reduce impact to the residences. The parking lot design has incorporated a generous perimeter landscape buffer adjacent to the existing residential to the east that varies from 34' to 38',

and a 20-foot landscape buffer adjacent to the existing apartments to the north and also to the west and south. Parking lot trees and landscaping per Town requirements will enhance the site and surrounding area and assist to minimize the visual impact to the development. Access to the warehouse and fuel facility will be from Interstate 80 at Sierra College Blvd. from a proposed signalized intersection at the southern portion of the site. Approximately 777 parking stalls are provided on site, which exceeds the required Town of Loomis parking requirement of 760 stalls. Landscape islands are typically provided at one island per 5 lineal parking spaces in the parking field. An ADA compliant pedestrian pathway will extend from the new warehouse to the western property boundary where it will connect to Sierra College Blvd. The project provides oversized parking stalls of 10' x 20' that are larger than the minimum requirements for the Town of Loomis to provide members with easier accessibility to vehicles.

The parking lot will be illuminated with standard downward pointing lights, each containing two LED fixtures affixed to a 37' foot light pole. The lighting fixtures are of a "shoe-box" style. Parking lot light standards are designed in order to provide even light distribution for vehicle and pedestrian safety. The parking lot lights will be timer controlled to limit lighting after the warehouse has closed and most employees are gone from the warehouse. Parking lot lighting will only remain on to provide security and emergency lighting only along the main driveways. Lighting fixtures will also be located on the building approximately every 40 feet around the exterior of the building to provide safety and security. Parking and site lighting will incorporate the use of cutoff lenses to keep light from overflowing beyond the project boundaries.

The landscape plan includes a mix of drought tolerant shrubs and grasses, and a variety of shade trees will be used throughout the parking field and along the project perimeter that are appropriate for the climate in Loomis.

Costco Warehouse Architecture

The warehouse design is contemporary and has set the standard for large format retail facades with variety of massing and appropriate materials for the building. By combining concrete masonry block and architectural metal panels, Costco is able to create a scale and architectural interest to minimize the visual impact of a large retail warehouse. By use of design techniques such as the location of building materials, landscaping, the incorporation of varying parapet cap heights, Costco can successfully break the long elevations both horizontally and vertically at the appropriate height to conceal roof top mounted mechanical equipment. The technique of breaking a long elevation into smaller elements with varied materials and colors is used to create a more pedestrian-friendly scale. The proposed colors are warm natural earth tones, which will relate to the proposed surrounding development by utilizing similar building materials and architectural detailing. The building entrance, located on the "skew" of the floor plan, creates a visual queue to the warehouse entry.

Building signage consists of the signature Costco red and blue corporate colors. The signage is scaled appropriately to the mass of the building elevations so as to not overwhelm but to reinforce the brand that Costco has established. The warehouse wall signage will consist of externally illuminated reverse pan channel letters, and the gas station signage will also be externally illuminated.

The warehouse has one customer entrance to the main Costco store located at the southeast corner. The Loomis Costco will include a bakery, pharmacy, optical center with optical exams and retail optical sales, hearing aid testing center, food court, and a photo center along with the sales of approximately 4,000 products. The warehouse also includes a Tire Center, a 5,478 square-foot facility with member access via the inside of the main Costco building, that includes tire sales and a tire installation facility. The installation facility has four bays that face east to allow Costco employees to drive the cars into the installation facility. A promotional vehicle may be on display near the entry

to the building. This vehicle is only to promote online or offsite vehicle sales; no vehicles are sold on site.

The truck loading dock is located at the southwest side of the building adjacent to Sierra College Blvd. to buffer noise to the adjacent apartments to the north and existing residences to the east. The bay doors will be equipped with sealed gaskets to limit noise impacts. A smaller on grade door is located on the west side of the building. This door is to receive bread delivery and Federal Express type trucks. A transformer and two trash compactors will also be located along the west edge of the building. Dense landscape material provides the necessary screening to this area (see Landscape Plan).

Costco Fuel Facility

The fuel facility includes a 7,560 square-foot canopy and a 106 square-foot controller enclosure that will be located on the southern portion of the planting island of the fuel station to house the control equipment. The controller enclosure will be built with steel walls and finished with paint to match the warehouse building colors. There will be four covered fueling bays, each with three two-sided fuel dispensers which will provide for the fueling of six cars at each island. The fueling station will also have 8 stacking lanes which will allow approximately 32 cars to wait for pumps at any given time in addition to the 24 at the dispensers. The gas station will have fueling capacity for 24 dispensers initially with expansion to 30 dispensers and an expansion to the canopy of 1,410 square-feet with vehicle stacking as needed which is to be approved with this application. The dispensers are fully automated and self-service for Costco members only, with a Costco attendant present to oversee operations and assist members with problems. Five underground fuel tanks will also be installed at the southern edge of the gas station. Lights will be recessed into the canopy and provide both lighting during operating hours and a lower level of security lighting after hours.

Costco Operations

Costco Wholesale is a membership-only retail/wholesale business, selling high quality national brands and private label merchandise for commercial and personal use. The warehouse hours are anticipated to be: Monday through Friday from 10:00 am to 8:30 pm, Saturday from 9:30 am to 6:00 pm, and Sunday from 10:00 am to 6:00 pm. The fuel facility hours are anticipated to be daily from 5:00 am to 10:00 pm

Costco anticipates an average of about 10 trucks delivering goods on a typical weekday. The trucks range in size from 26 feet long for single-axle trailers to 70 feet long for double-axle trailers. Receiving time is from 2:00 a.m. to 1:00 p.m., averaging 2 to 3 trucks per hour, with most of the deliveries completed before the 10:00 a.m. opening time. Deliveries to the warehouse are made primarily in Costco trucks from its freight consolidation facility in Tracy, California, coming to the site from Interstate 80, and accessing the site from Sierra College Drive.

It is estimated that fuel will be delivered to the gasoline facility in two to three trucks per day. The largest fuel trucks are approximately 70 feet long. While delivering the fuel, the truck will be parked over the underground tanks located on the east side of the gas facility. The truck will not block access to any of the fueling positions or occupy any queuing space. The fuel facility is located and specifically designed to avoid traffic and queuing conflicts with the warehouse and adjacent retail commercial uses.

In order to open and operate the gas facility, Costco will have to meet requirements of local, state and federal regulators and agencies, including the Town Fire Department, the County Department of Environmental Health, the Air Quality Management District, the State Water Resources Control

Board, the California Environmental Protection Agency, and the United States Environmental Protection Agency.

The tire center typically will receive shipments of tires one to two times per week in single- or double-trailer trucks of up to 70 feet in length, and the same delivery truck will pick up old tires for recycling. Deliveries to and pickups from the tire center will be scheduled for pre-opening hours, typically about 6:00 a.m.

Ancillary Uses: Alcohol Tasting License

Costco has recently developed an alcohol tasting protocol to be performed by authorized vendors within the warehouse to allow members to sample no more than three types of beer, wine or spirits in the warehouse prior to purchase. Costco is in the process of obtaining Type 86 Tasting licenses from California State Alcoholic Beverage Control in 16 locations in Southern and Northern California.

The tastings will be performed in a small area within the warehouse that has been sectioned off by a rope/cord that allows only members over the age of 21 to enter. Unlike the more formal tasting area with seating or bar area that you may see in stores such as Whole Foods, these areas are smaller and less formal, more similar to a typical Costco sampling area (except with a few more rules and precautions). Costco has taken significant steps to assure that this particular product is sampled responsibly and safely.

The following protocol will be followed:

- The tasting area (approximately 8' x 8') is physically separated from the rest of the sales area
- No one under 21 years of age may enter the tasting area
- Tastings are operated by authorized vendor personnel; one ID Checker and two Pourers
- Only one event per warehouse per day
- Tastings are limited to a single type alcoholic beverage. Either beer, wine or spirit by one particular vendor
- Amounts served cannot exceed 3 tastings PER person PER day; a serving is:
  - Wine: not to exceed one (1) oz.
  - Beer: not to exceed one (1) oz.
  - Spirits: not to exceed ¼ of one (1) oz.
- Open containers (glasses, etc.) may NOT leave the tasting area
- Tastings will take place during regular warehouse hours
- Like existing samplings there is no charge for tasting

Costco Energy-Efficient Project Components

In an effort to reduce energy consumption and promote sustainability, Costco will incorporate many energy saving measures when constructing a new facility. Below are some of the significant practices that Costco currently incorporates into new buildings that help conserve energy and other natural resources:

Energy Conservation:

- Parking lot light standards are designed in order to provide even light distribution, and utilize less energy compared to a greater number of fixtures at lower heights. The use of LED lamps provide a higher level of perceived brightness with less energy than other lamps such as high pressure sodium.

- New and renewable building materials are typically extracted and manufactured within the region. When masonry and concrete are used, the materials purchased are local to the project minimizing the transportation and impact to local road networks.
- The use of pre-manufactured building components, including structural framing and metal panels, helps to minimize waste during construction.
- Pre-manufactured metal wall panels with insulation carry a higher R-Value and greater solar reflectivity to help conserve energy. Building heat absorption is further reduced by a decrease in the thermal mass of the metal wall when compared to a typical masonry block wall.
- Costco uses a reflective cool roof material to produce lower heat absorption and thereby lowering energy requirements during the hot summer months. This roofing material meets the requirements for the EPA's Energy Star energy efficiency program.
- The warehouse includes over 200 skylights placed strategically throughout the metal roof. Photo sensors are placed at various locations on the roof as well as inside a number of skylights to accurately measure the amount of natural light entering the building. Interior warehouse lighting is reduced from 100% to 66% to 33% to 0%, based on daylight contribution through the skylights. Daylight is measured by exterior and interior photo sensors. This program allows lights to automatically shut off when they are not needed.
- A substantial amount of the proposed plant material for the new site is native drought tolerant and will use less water than other common species.
- The irrigation system includes the use of deep root watering bubblers for parking lot trees to minimize usage and ensure that water goes directly to the intended planting areas.
- Storm water management plans are designed to maintain quality control and storm water discharge rates based on the Town's requirements.
- Use of native species vegetation and drip irrigation systems greatly reduces potable water consumption.
- High-efficiency restroom fixtures achieve Achievement of a 40% decrease and water savings over U.S. standards by using high efficient restroom fixtures.
- The building is insulated to meet or exceed current energy code requirements.
- Commissioning of mechanical systems will occur to ensure that the HVAC systems are preforming as designed.
- HVAC comfort systems are controlled by a computerized building management system to maximize efficiency.
- HVAC units are high efficiency direct ducted units.
- HVAC units have phased out the use of HCFC's completely, long before the Montreal Protocol timeline.
- Parking lot and exterior lights are controlled by a photo sensor and time clock.
- Lighting is controlled by the overall project energy management system.

- Energy efficient Transformers (i.e., Square D Type EE transformers) are used.
- Variable speed motors will be used on make-up air units and booster pumps.
- Gas water heaters are direct vent and 94% efficient or greater.
- Reclaim tanks are used to capture heat released by refrigeration equipment to heat domestic water in lieu of venting heat to the outside.
- Main Building structure is a pre-engineered system that uses 100% recycled steel materials and is designed to minimize the amount of material utilized.
- Roof material is 100% recycled standing seam metal panel, designed to maximum efficiency for spanning the structure.
- Construction waste is recycled whenever possible.
- Floor sealant is No-VOC and represents over 80% of the floor area.
- Lighting systems are designed with employee controllability in mind. Lighting is controlled by timers but over-ride switches are provided for employee use.
- CO_2 is monitored throughout the warehouse.
- Extensive recycling/reuse program is implemented for warehouse and office space including tires, cardboard, grease, plastics and electronic waste.
- Use of plastic shopping bags is avoided.
- Suppliers are required to reduce packaging and consider alternative packaging solutions.
- Distribution facilities are strategically located to minimize miles traveled for delivery.
- Deliveries are made in full trucks.
- All Costco trucks are equipped with an engine idle shut off timers.

PROJECT OBJECTIVES

Objectives of the Proposed Project:
The proposed project has been designed to meet a series of objectives:

- Construct and operate a new Costco warehouse that serves the local community with goods and serves from both nationally known businesses but also more regional and local businesses.
- Reduce energy consumption by incorporating sustainable design features and systems with enhanced energy efficiencies meeting State and Federal code requirements.
- Provide a Costco warehouse in a location that is convenient for its members, the community, and employees to travel to shopping and work.
- Increase the number of employees and contribute to the local job/housing balance
- Provide a state of the art Costco warehouse to better serve the membership in the greater Loomis area.
- Enhance the area with a warehouse which is architecturally designed to be unique to the Town and sensitive to the adjacent community, future development(s) and compatible with the need for a new warehouse in this market area.
- Continue and increase contribution to the Town's tax base by Costco.
- Expand the space available for integrated retail sales of goods and services in the Town of Loomis.
- Design a site plan that minimizes circulation conflicts between automobiles and pedestrians.
- Plan and design for public transit access.
- Provide a Costco warehouse in a location that is serviced by adequate existing infrastructure including roadways and utilities.
- Develop a Costco warehouse that is large enough to accommodate all the uses and services Costco provides to its members elsewhere.
- Locate a Costco warehouse on a site Costco can purchase (rather than lease) to protect its substantial investment of time, money and goodwill in the location.

TOWN OF LOOMIS
PLANNING DEPARTMENT

ENVIRONMENTAL REVIEW ASSESSMENT

I. LAND USE AND PLANNING

1. Project Name (same as on Planning Application) Costco Warehouse

2. What is the general land use category for the project? Commercial
(residential, commercial, industrial, etc.)

3. What are the number of units or gross floor area proposed? 152,101 warehouse, and 30 dispenser fuel facility

4. Are there existing facilities on the site? (buildings, wells, septic systems, parking, etc.) Yes [ ] No [X]
If yes, show on the site plan and describe. _____

5. Is adjacent property in common ownership? Yes [ ] No [X] If yes, Assessor's Parcel Number (s) and acreage(s). _____

6. Describe previous land use(s) of the site over the last 10 years. Vacant parcel

7. Will the project require or provide storage for vehicles, equipment, materials, etc.? Yes [ ] No [X]
If yes, describe the location, size and type of storage (secured, covered, etc.) proposed. _____

II. POPULATION AND HOUSING

1. How many new residents will the project generate? N/A

2. Will the project displace or require the relocation of any residential units? Yes [ ] No [X] If yes, the number. _____

3. What changes in character of the neighborhood would result from project development? (surrounding land uses such as residential, agricultural, commercial, etc.) Development of a vacant parcel with a 152,101 square foot Costco warehouse with associated parking and landscaping on an existing commercially zoned property

4. Will the project create or destroy job opportunities? Create [X] Destroy [ ] Describe _____

5. Will the proposed project displace any currently productive use? Yes [ ] No [X] If yes, describe. _____

III. GEOLOGY AND SOILS

1. Are there any potential geologic hazards (soil settlement, steep slopes, slides, faults, etc.) associated with the project property or on surrounding properties? Yes [ ] No [X] If yes, describe. _____

2. Will grading on the site be required? Yes [X] No [ ] If yes, describe the grading anticipated for the project (locations, maximum depths/slopes of excavations and fills). _____

Estimate the grading area/quantities. +/- 17 acres acres _____ cubic yards

3. Will site excavation and fill quantities balance? Yes [X] No [ ] If no, describe the source(s) or disposal site(s), transport methods and haul routes required for grading materials. _____

4. Are retaining walls proposed? Yes [X] No [ ] If yes, describe location(s), type(s), height(s), etc. Gravity stack retaining

5. Describe the erosion potential of the project site and the measures that will be utilized to reduce erosion. The erosion potential is low and there will be strom drainage facilities on site to capture and treat runoff.

6. Will blasting be required during project construction? Yes [ ] No [X] If yes, describe. _____

7. Are there any known natural economic mineral resources on the project site? (sand, gravel, mineral deposits, etc.) Yes [ ] No [X] If yes, describe. _____

IV. HYDROLOGY AND DRAINAGE

1. Is there any body of water within or on the boundaries of the project site? (lake, pond, stream, canal, etc.) Yes [ ] No [X] If yes, name/describe the body of water and show on the site plan. _____

2. If there is a body of water within or on the boundaries of the project site, will water be diverted from this water body? Yes [ ] No [ ] If yes, describe. N/A

3. If water will be diverted, does the project applicant have an appropriative or riparian water right? Yes [ ] No [ ] If yes, describe. N/A

4. Where is the nearest off-site body of water such as a waterway, river stream, pond, canal, irrigation ditch or drainageway? Include the name of this water body, if applicable. Secret Ravine is the nearest receiving waterway located approximately 600' west of the project site

5. What area/percentage of the project site is presently covered by impervious surface? 0%
What will be the area/percentage of impervious surface coverage after development? 624,583 sf/ 83%

6. Will any runoff from the project site enter any off-site body of water? Yes [ ] No [X] If yes, identify the destination of the runoff. _____

7. Will there be a discharge to surface waters of wastewater other than stormwater runoff? Yes [ ] No [X] If yes, identify/describe the materials/contaminants present in this runoff. _____

8. Will the project result in the physical alteration of a body of water? Yes [ ] No [X] If yes, describe. _____

9. Will the drainage or runoff from this project cause or exacerbate downstream flooding? Yes [ ] No [X] If yes, describe. _____

10. Are there any areas of the project site that are subject to flooding or inundation? Yes [X] No [ ] If yes, describe. The FEMA Flood Insurance Rate Map number 06061C0418F, effective date June 8, 1998 indicates that the entire project site is Zone X. However, the highest water surface elevation in the "Loomis Tributary" (a.k.a. "Secret Ravine" near the site is 322 while the lowest existing site elevation is approximately 318 at the swale flowline before crossing under Sierra College Blvd. Based on those elevations, the site could be expected to experience some inundation along the northerly street frontage of Sierra College Blvd and along the westerly frontage of Brace Rd.

11. Will the project alter existing drainage channels and/or drainage patterns? Yes [X] No [ ] If yes, describe. The site receives run-on from the neighboring subdivision to the east at two locations. Currently, the northerly location appears to drain into a ground-level swale, then to an inlet which appears to flow across Brace Rd to the north, into a swale between bulidings to Secret Ravine. This outfall will be intercepted at or near the property line and conveyed through the site storm drain system to the exsting 24" culvert under Sierra College Blvd. locatated approximately mid-way along the site frontage. The second, southerly, outfall will also be intercepted at or near the property line and conveyed through the site storm drain system in the same way.

V. AIR QUALITY

Note: Specific air quality studies may be required to be conducted as part of the project review/approval process. Such specific studies may be included with the submittal of this questionnaire.

1. Are there currently any known sources of air pollution such as an industrial use or major roadway in the vicinity of the project? Yes [X] No [ ] If yes, describe. Sierra College Boulevard is located at the eastern boundary of the parcel.

2. Describe the following emissions sources related to project development:

   Construction emissions - Extent and duration of site grading activities: Approximately 2 months

   Stationary source emissions - Are woodstoves proposed in residential projects? Yes [ ] No [X]

   Mobile source emissions - Vehicle activities related to residential, commercial and/or industrial uses: N/A

3. Based on proposed use, will the project significantly contribute to the violation of ambient air quality standards? Yes [ ] No [X] If yes, describe (may require the results from specific air quality studies). _____

4. Are there any sensitive receptors to air pollution (such as schools or hospitals) located in the vicinity of the project? Yes [ ] No [X] If yes, describe. _____

5. Describe measures that are proposed by the project to reduce stationary and mobile source emissions?

6. Will vegetation be cleared from the project? Yes [X] No [ ] If yes, describe the method of disposal.
Removal of trees and clearing and grubbing of the site will occur. Disposal of the debris will be recycled as green waste at the land fill site.

VI. TRANSPORTATION/CIRCULATION

Note: Detailed traffic studies prepared by a qualified traffic consultant may be required, following review of the information presented below. Such studies may be included with the submittal of this questionnaire.

1. Does the project front on a local roadway? Yes [X] No [ ] If yes, what is the name of the roadway?
Sierra College Boulevard

If no, what is the name and distance of the nearest roadway?

2. Will new entrances onto local roadways be constructed. Yes [X] No [ ]
If yes, describe. One new drive way entrance off Sierra College Boulevard is proposed with the project.

3. Would any non-automobile traffic result from the development of the project? Yes [X] No [ ] If yes, describe. Costco delivery trucks will deliver both merchandise and perishable items as well as fuel on a daily basis. The trucks range in size from 26 feet long for single-axle trailers to 70 feet long for double-axle trailers. Receiving time is from 2:00 a.m. to 1:00 p.m., averaging 2 to 3 trucks per hour, with most of the deliveries completed before the 10:00 a.m. opening time. Deliveries to the warehouse are made primarily in Costco trucks from its freight consolidation facility in Tracy, California, coming to the site from Interstate 80, and accessing the site from Sierra College Drive. It is estimated that fuel will be delivered to the gasoline facility in two to three trucks per day. The largest fuel trucks are approximately 70 feet long.

4. If applicable, what road standards are proposed within the project? See attached Civil Engineering Plans.
(Show typical street sections(s) on the site plan.)

5. Will a new entrance(s) onto local roadways be constructed? Yes [X] No [ ]
If yes, show location(s) on site plan.

6. Describe any frontage improvements to the local roadway(s). Frontage improvements will occur to both Sierra Collebge Boulevard and Brace Road and will consist of new curb, gutter, and sidewalk frontage improvements. Sierra College Boulevard will also be improved to provide decel and acceleration improvements at the driveway entry. Final improvements for the streets are still under consideration by the Town of Loomis.

7. Describe the traffic that will be generated by the project (average daily traffic [ADT], peak hour volumes and peak hour times/days). A traffic study is under preparation and the results of the analysis are pending.

8. Will this traffic affect the service levels at an existing major street intersection or freeway interchange?
Yes [ ] No [ ] If yes, describe. A traffic study is under preparation and the results of the analysis are pending.

9. Are pedestrian, bicycle, equestrian and/or transit facilities proposed with the project? Yes [x] No [ ]
If yes, describe. Frontage improvements along the project property boundary will include sidewalks, bicycle racks will be included per the requirements of the California Building Code, and transit facilities are not proposed as part of the project.

10. Will the project require provisions for parking? Yes [X] No [ ] If yes, describe the number, size, location and access of the parking facilities proposed. 777 parking spaces are required for the project which is greater than the 760 required. The parking spaces are oversized 10' x 20' which meets the requirements of the Town of Loomis.

11. Will there be company vehicles associated with the project? Yes [ ] No [X] If yes, describe the number and type of vehicles and the parking that will be provided for these vehicles (see 10, above).

VII. BIOLOGICAL RESOURCES

Note: Detailed studies or exhibits (e.g., tree survey, wetlands delineation) may be required, following a review of the information presented below. Such studies or exhibits may be included with the submittal of this questionnaire.

1. Briefly describe site vegetation. The project site is made up of Valley Oak Woodland, Annual Grassland, and Freshwater Marsh.

2. Will any trees of 6-inches diameter breast height (dbh) or greater be removed as a result of project development? Yes [ ] No [ ] If yes, describe the number of trees to be removed, tree species, tree inches and the percentage of the trees on the site that the removals represent. Approximately 372 trees exist on the site, 352 to be removed, for a removal percentage of approximately 95%. The size, species, and description of condition can be seen in further detail on the topographic survey sheets (C1 – C3) in tabular form by Hort-Science, and the arborist report by Mann Made Resources.

3. Briefly describe wildlife typically found in the area. Much of the wildlife observed included resident and wintering species of birds that are adapted to the mix of wetland and upland habitats found at the site. Resident bird species observed include red-shouldered hawk, Anna's hummingbird, mourning dove, Northern flicker, acorn woodpecker, Nuttall's woodpecker, black phoebe, western bluebird, California scrub-jay, European starling, Northern mockingbird, oak titmouse, bushtit, white-breasted nuthatch, Bewick's wren, California towhee, white-crowned sparrow, song sparrow, purple finch and house finch. Species observed that are expected only during the winter include red-breasted sapsucker, American robin, hermit thrush, rubycrowned kinglet, yellow-rumped warbler, and golden crowned sparrow. Although no mammals were documented at the site, it is expected that mammals adapted to urban environments would be found on the property including striped skunk, raccoon, Virginia opossum, deer mouse and mule deer. Despite looking under logs and boards, no reptiles were observed and the only amphibian recorded was Pacific treefrog. Additional amphibians likely include western toad, and common reptiles likely include western fence lizard, southern alligator lizard, western skink, ringneck snake, gopher snake and common garter snake.

4. Describe changes to site habitat(s) resulting from development of the project. Loss of vegetation associated with the habitats on site will disrupt and displace existing wildlife. Some bird roosting, nesting, and foraging areas will be eliminated. Reptiles, amphibians, and small mammals that utilize these areas will be displaced to remaining undisturbed areas. Open space areas near the project area should be capable of accommodating these species.

5. Are any rare or endangered species (as defined in Section 15380, CEQA Guidelines) found in the project area? Yes [ ] No [X] If yes, describe. A search of the CNDDB records of occurrence for special status animals and plants and natural communities within these quadrangles indicated that none have been documented as occurring on the Project Site itself, but that a number of special status animal species have been known to occur in the project vicinity.

6. Are any federally-listed threatened species, or candidates for listing, found in the project area? Yes [ ] No [ ] If yes, describe. See 5 above

7. Is there a rare natural community (monitored by the DFG Natural Diversity Data Base) present on the project site? Yes [ ] No [ ] If yes, describe. See 5 above

8. Are there wetlands (i.e., seasonal wetlands, wetland swales, riparian corridor, etc.) on the project site? Yes [X] No [ ] If yes, describe (type, acreage, etc.). Direct (fill) impacts to 0.15 acres of waters of the U.S. would result from implementation of the proposed Costco warehouse facility.

9. If yes, will project development affect these wetland areas? Yes [X] No [ ] If yes, describe. The development plan for the site would permanently impact 0.15 acres of palustrine emergent wetlands located on the site that are potentially under the jurisdiction of the Corps under Clean Water Act Section 404.

10. If yes, will a Corps of Engineers permit be required for disturbing site wetlands? Yes [X] No [ ]

VIII. HAZARDOUS MATERIALS

Hazardous material are defined as any material that, because of its quantity, concentration or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste and any material (including oils, lubricants and fuels) which a handler or administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or environment.

1. Will the proposed project involve the handling, storage or transportation of hazardous materials? Yes [X] No [ ]

If yes, attach a list of all hazardous materials to be handled/stored at the project site. The list needs to include (but is not limited to) fuels, chemicals, cleaners, lubricants, coolants, biocides, etc. A description needs to be included explaining how these materials will be managed, used, stored, disposed/recycled.

Describe any hazardous wastes that will be generated and detail how/where they will be stored and disposal of. Include an outline of the proposed chemical emergency spill response plan.

If yes, will the project involve the handling, storage or transportation of more than 55 gallons, 500 pounds or 200 cubic feet (STP) at any one time of a product or formulation containing hazardous materials or will any of these materials be stored in underground storage tanks? Yes [X] No [ ]
If yes, please contact the Placer County Environmental Health Division at 889-7335 for an explanation of additional requirements.

IX. NOISE

Note: Projects located near a major noise source and/or projects that will result in increased noise generation or exposure may require a detailed noise study (with any proposed mitigations) prior to environmental determination.

1. Is the project located near a major noise source? Yes [X] No [ ] If yes, describe. Sierra College Boulevard

2. Describe the noise that will be generated by this project, both during construction and following project development. A noise study is under preparation and will present the sources and projected noise levels gerated during construction as well as post project development.

X. PUBLIC SERVICES

FIRE AND EMERGENCY MEDICAL SERVICES

1. Describe the nearest fire protection facilities (location, distance, agency). Loomis Fire District Fire Station, 5840 Horseshoe Bar Road

2. Describe the nearest emergency water source for fire protection purposes (type, location, distance, agency). A looped fire service at the warehouse is proposed that will provide the necessary fire flows is proposed as part of the project.

3. Describe the fire hazard and fire protection needs created as a result of project development. The project will require a 10" – 12" fire service at 1,600 GPM for fire sprinklers at a residual pressure of 55 PSI and fire fighting flow of 4,000 GPM at a residual pressure of 20 PSI

4. Describe the on-site fire protection facilities proposed with this project. The warehouse will include fire protection systems as required and there will be fire hydrants located around the perimeter of building.

5. If this is a single access project, what is the distance from the project to the nearest through roadway/name of roadway? There are two points of access shown for the project

6. Describe parking area access, number of spaces and entry/exit for emergency vehicles. Two points of access are shown for the project, the main entry off Sierra College Boulevard, and a secont off Brace Road. 777 parking spaces are shown on the site plan. There is a 30' drive aisle that loops around the entire warehouse providing access by emergency vehicles.

7. Are there any site limitations that will limit accessibility by emergency service vehicles? Yes [ ] No [X] If yes, describe.

8. Estimate the number of persons on-site (residents or employees/visitors) 160 to 170 employees are anticipated for the project.

LAW ENFORCEMENT

1. Describe the access to the site and entrance features (gates, etc.). There are no gates that would limit access to the site

2. Describe the security protection that will be provided on the site, if any. There will be security lighting at the warehouse that will remain on after typical warehouse hours.

3. Describe the location, visibility and lighting of vehicle and equipment storage areas. Lighting of the parking lot and around the warehouse will be provided to provide safe circulation of vehicles and pedestrians.

WATER

1. Is the project within a public domestic water system district or service area? Yes [X] No [ ] If yes, describe the district/area. There is an existing 8" water main in Sierra College Boulevard, and a 12" water main in Brace Road. Water service will be provided by Placer County Water Agency.

2. Can the district serve the project? Yes [X] No [ ]

3. What will be the water source(s) for the project? Domestic water supplied by Placer County Water Agency

4. What is the estimated usage and peak usage of the project? 10,000 gpd/ _____ gpd

5. Are there any existing or abandoned wells on the site? Yes [ ] No [X] If yes, describe (location, depth, yield, contaminants, etc.) _____

WASTEWATER

1. Is wastewater presently disposed on the site? Yes [ ] No [X] If yes, describe the method(s) and quantities (gpd). _____

2. Is the project located within a sewer district? Yes [X] No [ ] If yes, describe. South Placer Municipal Utility District

   If yes, can the district serve the project? Yes [X] No [ ]

   Is there sewer service in the area? Yes [ ] No [ ] If yes, what is the distance to the nearest collector line? 8" Sanitry Sewer main in Sierra College Boulevard and Brace Road.

3. What are the projected wastewater quantities (gpd) generated by the project and the proposed method of disposal? 5-8,000 gpd Gravity flow sewer system to existing sewer mains

4. Will there be any unusual characteristics associated with project wastewater? Yes [ ] No [X] If yes, describe any special treatment processes that may be necessary for these wastes. _____

5. During the wettest time of year, is the groundwater level on the project site less than 8 feet below the surface of the ground? Yes [ ] No [X]

SOLID WASTE

1. Describe the type(s) of solid waste and estimate the quantities of waste per day/month that will be produced by the project. Specify if there are any special wastes (chemicals, infectious waste, oils, solvents, recyclables, etc.) Solid waste including recycling will be provided by Recology Auburn/Placer

2. Describe the disposal method of this waste material. Costco has two weather tight compactor that will be serviced by Recology.

3. Describe the access that will be provided to refuse removal vehicles and the location and design of recycling and refuse storage equipment. Costco will coordinate with Recology on pick up services for the two large compactors located on the south side of the warehouse. A 30' drive aisle will provide access to the compactors and backup and truck turning to the compactors.

PARKS AND RECREATION

1. What is the distance from the project to the nearest public park or recreation area? Loomis Basin Community Park, approximately 2-miles from the site
What is the name of this facility? Loomis Basin Community Park

2. Are any park or recreation facilities proposed as part of the project? Yes [ ] No [X] If yes, describe.

SCHOOLS

1. What are the nearest elementary and high schools to the project? Loomis Grammer School, Del Oro High School

What are the distances to these schools from the project? , 1.5 miles (grammer school) 2-miles (high school)

XI. AESTHETICS

1. Is the proposed project consistent/compatible with adjacent land uses and densities? Yes [X] No [ ]
Describe the consistencies/compatibilities or inconsistencies/incompatibilities. See attached Project Description discussing project architecture

2. Is the proposed project consistent/compatible with adjacent architectural styles? Yes [X] No [ ]
Describe the consistencies/compatibilities or inconsistencies/incompatibilities. See attached Project Description discussing project architecture and compatibility with architectural styles and detailing consistent with the Town of Loomis.

3. Describe the signage and/or lighting proposed by the project. See attached Project Description discussing signage.

4. Is landscaping proposed? Yes [X] No [ ] If yes, describe. See attached Project Description discussing the landscape portion of the project.

XII. CULTURAL RESOURCES

Note: If the project site is located on or near an archaeological, historical or paleontological site, specific studies may be required.

1. Does the project site support any archaeological, historical or paleontological features (e.g., Native American habitation sites, old foundations or structures, etc.)? Yes [ ] No [ ] If yes, describe.
A Cultural Resources investigation has not been completed for the site and will be included with the EIR.

2. What is the nearest archaeological, historical or paleontological site? Unknown at this time

What is the name of this site? Unknown at this time

NOP Comments

ROCKLIN
CALIFORNIA

June 14, 2017

Bob King, Town Planner
Town of Loomis
P.O. Box 1330
Loomis, CA 95650

SUBJECT: Notice of Preparation (NOP) for the Costco Warehouse and Fuel Facility Project

Dear Bob:

Thank you for the opportunity to review the Costco Warehouse and Fuel Facility NOP. Based on the project description provided in the NOP, the 17.4 +/- acre project is located on the east side of Sierra College Boulevard and south of Brace Road and consists of a 152,101 square foot Costco Wholesale warehouse building, with 777+/- parking stalls, a 24-dispenser fuel facility with potential expansion to 30 dispensers, and associated landscaping and street frontage improvements. Other aspects of the project include temporary outdoor sales within the parking field for seasonal sales, a tire center, vehicle display near the building entry for on-line and off-site automobile sales, and signage. The warehouse hours are anticipated to be Monday-Friday, 10:00 a.m. to 8:30 p.m., Saturday from 9:30 a.m. to 6:00 p.m. and Sunday from 10:00 a.m. to 6:00 p.m., and the fuel facility hours are anticipated to be daily from 5:00 a.m. to 10:00 p.m.

Primary vehicular access to the project site for the general public, fuel trucks and other merchandise delivery trucks exiting the site would be provided from a proposed new signalized intersection on Sierra College Boulevard. A secondary limited right-in and right-out driveway entrance is proposed on Brace Road and primarily intended for incoming merchandise truck deliveries and emergency exiting. . Costco delivery trucks ranging in size from 26 feet to 70 feet will average about 10 per typical weekday, with receiving times from 2:00 a.m. to 1:00 p.m., averaging 2 to 3 trucks per hour, with most of the deliveries completed before the 10:00 a.m. opening time. Fuel trucks approximately 70 feet long will average two to three trucks per day.

The concept of a new Costco facility on the I-80 corridor in close proximity to Rocklin is considered desirable. However, due to the project's location on the border of the City of Rocklin with primary regional access to the site being provided through use of the Sierra College Boulevard interchange and via Granite Drive (both within Rocklin) there is a heightened level of interest as to how the proposed project may affect the City and improvements that have been funded and are maintained by Rocklin. We have completed our review of the NOP and would like to offer the following comments:

1. The EIR should also assess any potential impacts on the Sierra College/I-80 interchange and on City of Rocklin roadways and intersections in the vicinity of the project. Funding contributions/financial participation or the construction of improvements may be required if impacts are identified. Specifically, because Costco will be a regional destination it is suggested that the scope of the traffic analysis be similar to the traffic analyses that were conducted for the Rocklin Crossings and Rocklin Commons shopping centers. The traffic analysis for the proposed project should include at a minimum, the following list of City of Rocklin intersections:

- Pacific Street/Rocklin Road (planned roundabout)
- Granite Drive/Rocklin Road
- Interstate 80/Rocklin Road EB and WB ramp intersections
- Dominguez Road (Del Mar Avenue)/Pacific Street
- Granite Drive/Dominguez Road
- Granite Drive/Sierra College Boulevard
- Interstate 80/Sierra College Boulevard EB and WB ramp intersections
- Sierra College Boulevard/Dominguez Road/Bass Pro Drive
- Newly proposed signal at Schriber Way/Sierra College Boulevard
- Sierra College Boulevard/Sierra College Stadium Entrance Roadway
- Sierra College Boulevard/Rocklin Road
- Rocklin Road/El Don Drive
- Rocklin Road/Aguilar Road

The EIR should utilize traffic count information taken while local schools are in session and should assess traffic impacts associated with the proposed project under existing, existing plus approved projects, and buildout (cumulative) conditions, including:

- increases in traffic on local and regional roadways with mitigation to be addressed at the project-specific level and not through a reliance on a future project or future funding mechanism;
- level of service impacts;
- access and parking impacts, particularly as it relates to future adjacent retail commercial development in Rocklin;
- impacts to/conflicts with alternative transportation policies, plans, or programs, and
- affects that a project of this scope and scale may have on current regional transportation infrastructure funding mechanisms and formulas. To date Loomis has not participated in the SPRTA Program or funding of regional improvements to the Sierra College Boulevard corridor. Appropriate participation in a regional funding mechanism such as SPRTA should be evaluated and identified as a component of the project's mitigation.

2. The proposal for one primary general access point into and out of the site is of particular concern due to the historic nature of traffic patterns associated with this type of regional destination use and from a life safety perspective. The existing Costco facility in Roseville is known to experience congestion in and around the site and that facility has at least three general use access points with an additional two nearby driveways available on adjacent

properties. The Costco in Citrus Heights has eight access points onto a long commercial driveway that customers can use to enter and exit the site. The Costco in Folsom has two main points of general ingress and egress and these entrances are fed by long commercial drives leading to nearby arterials rather than driveways that front directly onto adjacent arterials or collector streets. In addition to the limited number of access points, the location of the large fuel dispensing facility very close to the singular primary ingress and egress point is also of concern. It is difficult to imagine that the proposed circulation system for the project will not result in vehicles queuing back onto City streets and intersections. The traffic and site access analysis in the EIR will need to analyze these issues in detail. It is our recommendation that additional general access points be created for the project.

3. Due to the site access concerns listed in Item 2. above, the City strongly recommends that the location of the fuel dispensing facility be relocated to as far away from the main entrance as possible.

4. Due to the close proximity of the site to multiple existing and/or planned signalized intersections on the Sierra College Boulevard corridor, it is likely that synchronization of traffic signals will need to be considered. The project's contribution and implementation of this effort will need to be coordinated with the City of Rocklin.

5. The proposed project will generate considerable additional heavy truck traffic utilizing both the Sierra College interchange and Granite Drive (over 7,200 trip ends (10 in/10 out for roughly 360 days per year). The additional truck traffic should be factored into the analysis for effects on queuing and for ongoing damage to pavement facilities in Rocklin). Mitigation or separate agreements should be created to offset and address these effects on an ongoing basis.

6. The Town of Loomis did not participate in the funding of the Sierra College interchange improvements, however, this project would require and clearly benefits from the existence of the recently expanded interchange. Contributions similar to those charged to other similarly situated properties in the vicinity of the interchange should be addressed through mitigation or separate agreements with the City.

7. A portion of Sierra College Boulevard in the vicinity of the project is located within the Rocklin City limits and a portion is within the Town's incorporated limits. The final location of the new signal at the entrance into the facility will need to be determined in coordination with planned development needs for property across the street in Rocklin. Arrangements regarding all aspects of maintenance for the street section, median and signal will need to be addressed in detail between the two agencies.

8. It is our understanding that the Loomis General Plan identifies the Horseshoe Bar/Interstate 80 (I-80) overcrossing as a future four-lane facility and it currently exists as a two-lane facility. The EIR should assess any potential impacts on the current overcrossing and interchange configuration to determine if it is adequately sized to accommodate additional traffic from the Costco project and other planned growth within Loomis and the region.

9. Due to Rocklin's downstream location relative to the project and the anticipated stormwater drainage from the project site, the EIR should assess any potential impact associated with potential downstream flooding and storm drainage water quality that could be created by the project.

10. The EIR should assess any potential effects that the project could have on public services, particularly fire and police services and the potential need for mutual aid from the City of Rocklin Police and Fire Departments. It is suggested that typical calls for service at northern California Costcos and the Roseville Costco be used to establish and quantify potential calls for service at the new location.

11. The City has not yet received a Referral/Request for Comment for the project; therefore, we reserve the right to address any other items regarding the project, including those relative to building design and architectural treatment, etc. when that opportunity is formally provided. In general we would expect that the architectural detail and materials used should be at the level of quality and design that has been implemented at the Rocklin Commons and Crossings projects.

If there are any questions regarding these comments, please contact me at (916) 625-5162.

Sincerely,

David Mohlenbrok
Environmental Services Manager

cc: Rick Horst, City Manager
City Councilmembers
Marc Mondell, Director of Economic and Community Development
Laura Webster, Director, Office of Long Range Planning
Bret Finning, Planning Services Manager

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
703 B STREET
MARYSVILLE, CA 95901
PHONE (530) 741-4286
FAX (530) 741-5346
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

June 9, 2017

GTS# 03-PLA-2017-00068
03-PLA-80 PM 7.723
SCH# 20170520077

Mr. Jeff Berberich
City of Loomis
3581 Mt. Diablo Blvd., Suite 235
Lafayette, CA 94549

Costco Warehouse and Fuel Facility

Dear Mr. Jeff Berberich:

Thank you for including the California Department of Transportation (Caltrans) in the environmental/application review process for the project referenced above. The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Local Development-Intergovernmental Review (LD-IGR) Program reviews land use projects and plans through the lenses of our mission and state planning priorities of infill, conservation, and travel-efficient development. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network.

The proposed project will construct a new 152,101 sqft Costco Wholesale warehouse building with 777 parking stalls and associated landscaping on a 17.38 acre parcel. The project also includes a 24 dispenser fuel facility with potential future expansion to 30 dispensers. The project is located at the southeast corner of the intersection of Brace Road and Sierra College Blvd in Loomis. The following comments are based on the Notice of Preparation (NOP) of an Environmental Impact Report (EIR).

Vehicle Miles Travelled (VMT) and Traffic Operations

In response to the provisions of Senate Bill 743, we encourage the integration of transportation and land use in a way that reduces VMT and Greenhouse Gas (GHG) emissions by facilitating the provision of more proximate goods and services to shorten trip lengths, as well as achieve a high level of non-motorized travel and transit use. As such, we encourage the evaluation of the potential of Transportation Demand Management (TDM) strategies and Intelligent Transportation System (ITS) applications in order to better manage the transportation network, as well as transit

service and bicycle or pedestrian connectivity improvements. The Department also seeks to reduce serious injuries and fatalities, as well as provide equitable mobility options for people who are economically, socially, or physically disadvantaged. Therefore, we encourage the evaluation of the project site for access problems, VMT, and service needs that may need to be addressed.

The proposed development could have significant traffic impacts at the existing location. please include, in the scope, Sierra College Blvd./ I-80 interchange, the Horseshoe Bar/I-80 interchange, Sierra College Blvd., and mainline I-80 between Horseshoe Bar Road and Sierra College Blvd.

The environmental document should include an analysis of the multimodal travel demand expected from the proposed project. This analysis should also identify potentially significant adverse impacts from such demands and avoidance, minimization, and mitigation measures needed to address them.

Early collaboration, such as sharing the analysis for review and comment prior to the environmental document, leads to better outcomes for all stakeholders.

Given that Caltrans current guidelines are in the process of being updated, a transportation impact study scoping meeting with District staff could be used to discuss the most appropriate methodology for this analysis. At a minimum, the analysis should provide the following:

1. Vicinity maps, regional location map, and a site plan clearly showing project access in relation to nearby roadways and key destinations. Ingress and egress for all project components should be clearly identified. Clearly identify the State right-of-way (ROW). Project driveways, the State Highway System and local roads, intersections and interchanges, pedestrian and bicycle routes, car/bike parking, and transit routes and facilities should be mapped.

2. Project-related VMT should be calculated factoring in per capita use of transit, rideshare or active transportation modes and VMT reduction factors. The assumptions and methodologies used to develop this information should be detailed in the study, should utilize the latest place based research, and should be supported with appropriate documentation. Mitigation for any roadway section or intersection with increasing VMT should be identified and mitigated in a manner that does not further raise VMT.

3. Schematic illustrations of walking, biking and auto traffic conditions at the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for AM and PM peak periods. Operational concerns for all road users that may increase the potential for

future collisions should be identified and fully mitigated in a manner that does not further raise VMT.

For any traffic mitigation proposed, please provide construction cost estimates and a timeline for completion. If the project will be paying into an impact fee, please provide what amount will be set aside for highway improvements.

Please provide our office with copies of any further actions regarding this project. We would appreciate the opportunity to review and comment on any changes related to this development.

If you have any question regarding these comments or require additional information, please contact David J. Smith, Intergovernmental Review Coordinator for Placer County, by phone (530) 634-7799 or via email to david.j.smith@dot.ca.gov.

Sincerely,

KEVIN YOUNT, Branch Chief
Office of Transportation Planning
Regional Planning Branch—North

Robert King

From: Carie Huff [chuff@spmud.ca.gov]
Sent: Wednesday, June 14, 2017 8:11 AM
To: Robert King
Cc: Eric Nielsen
Subject: SPMUD Response to Notice of Preparation (Costco)
Attachments: Response to Notice of Preparation_6-14-17.pdf; SPMUD_L11.pdf

Good morning,

Attached is the District's response to the Notice of Preparation for the Costco in Loomis along with a copy of the District's facility map.

Please let me know if you have any questions or need additional information.

Regards,

Carie Huff, P.E.
Associate Engineer - Technical Services
South Placer Municipal Utility District
5807 Springview Drive
Rocklin, CA 95677
Tel: 916-786-8555 x311
Fax: 916-786-8553
chuff@spmud.ca.gov

South Placer Municipal Utility District
5807 Springview Drive
Rocklin, CA 95677
(916) 786-8555

June 14, 2017

Robert King
Town of Loomis
P.O. Box 1330
Loomis, CA 95650

Subject: **Costco Loomis – Sierra College Boulevard and Brace Road**

Dear Mr. King,

Thank you for contacting the District regarding the development of Costco at the corner of Sierra College Boulevard and Brace Road in Loomis.

The design and construction of all on-site and off-site facilities which may be required as a result of this project, including the acquisition and granting of sewer easements, will be the responsibility of the developer/owner. All work shall conform to the Standard Specifications of SPMUD. Improvement plans shall be submitted to SPMUD for review and approval. A copy of the District's facility map has been provided for your use. Please refer to Ordinance 09-02 for information regarding participation fees.

The District has reviewed the request for sewer service availability and the following comments apply:

a. Downstream portions of the sewer collection system that serve this property have capacity deficiencies. Construction of the Loomis Diversion Line, which will address the capacity deficiencies, is anticipated to begin this summer. Once the owner and/or owner's representative meets with District staff in order to discuss the project and determine project specific requirements, a will-serve letter will be issued.
b. The property may be able to sewer out to Granite Drive. Further analysis would be required in order to pursue this alternative.
c. A sewer study may be required as design progresses.

Additional requirements may be included as design information is provided.

Prior to issuing a will-serve letter for sewer service, the owner and/or owner's representative will need to schedule a meeting with District staff in order to discuss the project and to determine specific requirements.

South Placer Municipal Utility District
5807 Springview Drive
Rocklin, CA 95677
(916) 786-8555

Please note that the District's Standard Specifications and Improvement Standards for Sanitary Sewers can be viewed at SPMUD's website:

http://spmud.ca.gov/developer-resources/standards-specifications/

The District's Fee Schedule can be found at the following location:

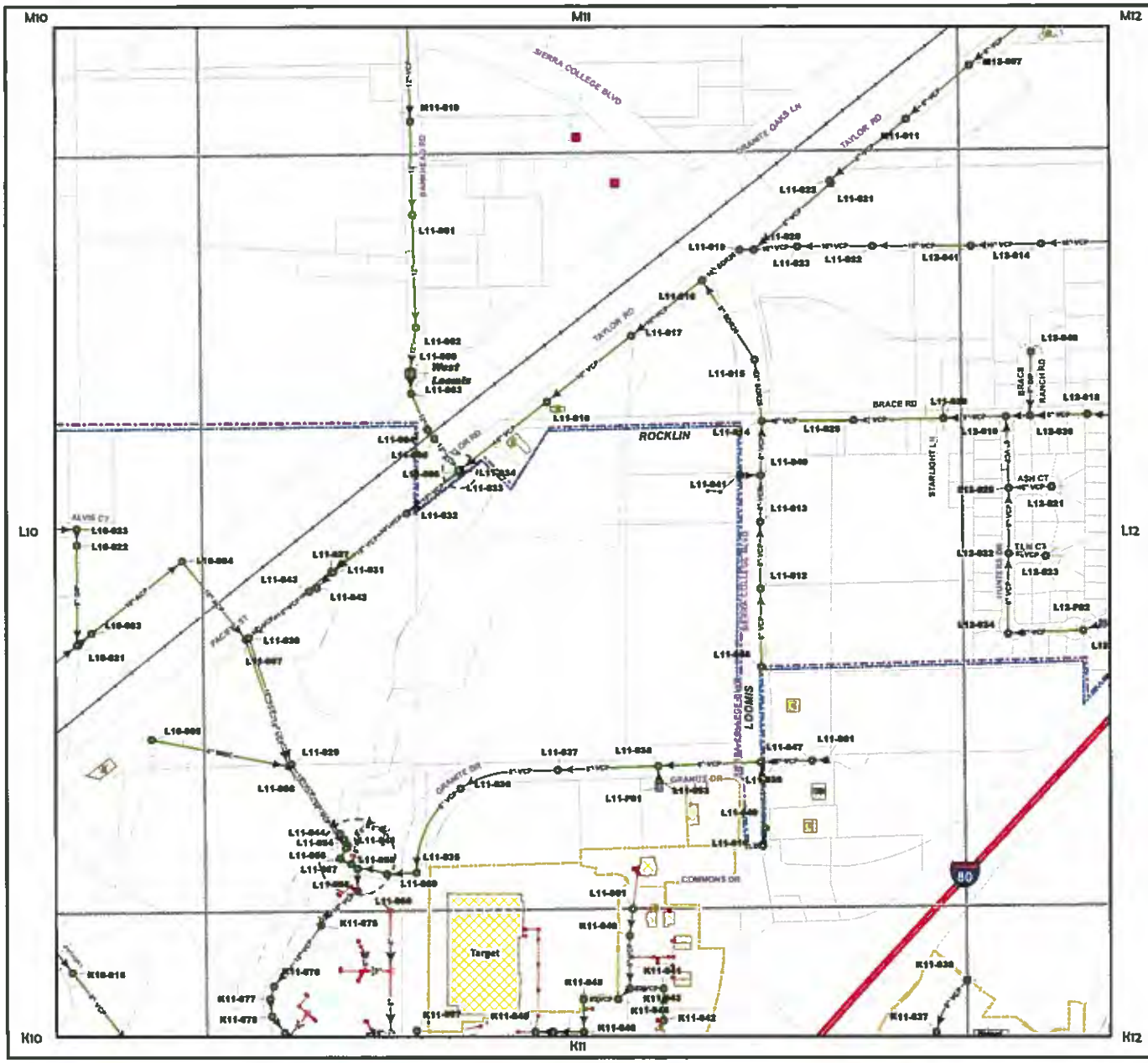
http://spmud.ca.gov/wp-content/uploads/2014/08/FY16-17-Fee-Schedule.pdf

Please do not hesitate to contact me at (916) 786-8555 extension 311 or chuff@spmud.ca.gov if you have any questions or need additional information.

Sincerely,

Carie Huff, P.E.

Attachments: SPMUD Facility Map



SOUTH PLACER M.U.D.

MAP: L11

SEWER SYSTEM

MAP SYMBOLS

Sanitary Structure Inventory
Component Type - Status - Owner
- Manhole - Operational - SPMUD
- Inside Drop - Operational - SPMUD
- Outside Drop - Operational - SPMUD
- Split - Operational - SPMUD
- Mainline Clean Out - Operational - SPMUD
- Port - Operational - SPMUD
- Blind Wye - Operational - SPMUD
- Blind Tee - Operational - SPMUD
- Stub/Cap - Operational - SPMUD
- Flushing Branch - Operational - SPMUD
- Manhole - Proposed - SPMUD
- Inside Drop - Proposed - SPMUD
- Outside Drop - Proposed - SPMUD
- Split - Proposed - SPMUD
- Port - Proposed - SPMUD
- Stub/Cap - Proposed - SPMUD
- Flushing Branch - Proposed - SPMUD
- Manhole - Out of Service - SPMUD
- Port - Out of Service - SPMUD
- Split - Out of Service - SPMUD
- Manhole - Operational - Other

Sanitary Pipe Inventory
Line Type - Status - Owner
- Force Main - Operational - SPMUD
- Force Main - Out of Service - SPMUD
- Gravity Line - Operational - SPMUD
- Gravity Line - Proposed - SPMUD
- Gravity Line - Out of Service - SPMUD
- Gravity Line - Operational - Other

Sewer FOG Extractor
- Grease Trap
- Grease Interceptor

Sewer System Valves
- Operational
- Proposed
- Out of Service

Sewer Service Connections
- Operational
- Proposed

Sanitary Sewer Services
- SPMUD, Operational
- SPMUD, Operational, Double Wye
- SPMUD, Proposed
- Private, Operational
- Out of Service

Sanitary Pump Stations
- Flow Recorder - Operational
- Lift Station - Operational
- Lift Station - Out of Service

Private Structure Inventory
- Private Structure Inventory

Private Sanitary Pipe Inventory
- Force Main
- Gravity Line

Private Sewer Services Connections
- Private Sewer Services Connections

Private Sanitary Sewer Services
- Grease
- Waste
- Pump

Private Pump Stations
- Lift Station

Private Facility Site
- Private Facility Site

Boundary
- Map Grid
- SPMUD Boundary
- City of Rocklin
- City of Roseville
- Town of Loomis
- Newcastle

Detail Callout
- Callout

NOTES:
NONE

200 0 200 400
Scale Feet
1" = 400'
N

GRID UPDATED
2/28/2017

Placer County
Health and Human Services Department

Jeffrey S. Brown, M.P.H., M.S.W.
Department Director

Wesley G. Nicks, R.E.H.S.
Environmental Health, Director

MEMORANDUM

DEPARTMENT OF HEALTH & HUMAN SERVICES
ENVIRONMENTAL HEALTH SERVICES

To: Robert King, Town of Loomis

From: Joey Scarbrough, Technical Specialist
Land Use and Water Resources Section

Date: May 25, 2017

Subject: **Costco Warehouse and Fuel Facility, Notice of Preparation**

Environmental Health Services has reviewed the above mentioned application and has the following comments.

1. Prior to this project moving forward to a public hearing or project approval, provide a Phase 1 Environmental Site Assessment performed to ASTM Standard E 1527-05. This will need to be reviewed by this department to determine if potential environmental concerns occur on site. If so, Phase 2 limited soil investigation should be completed in accordance with the California EPA, Department of Toxic Substances Control (DTSC).

2. Submit to the Environmental Health Services a "will-serve" letter from the franchised refuse collector for weekly or more frequent refuse collection service. The refuse collection provider shall also approve the location of the trash receptacle(s) on-site.

3. Submit to Environmental Health Services a "will-serve" letter from the South Placer Municipal Utility District indicating that the district can and will provide sewerage service to the project. The project shall connect the project to this public sewer.

4. Submit to Environmental Health Services, for review and approval, a "will-serve" letter or a "letter of availability" from the Placer County Water Agency for domestic water service. The applicant shall connect the project to this treated domestic water supply.

5. "Hazardous materials" as defined in Health and Safety Code Division 20, Chapter 6.95 shall not be allowed on any premises in regulated quantities (55 gallons, 200 cubic feet, 500 pounds) without notification to Environmental Health Services. A property owner/occupant who handles or stores regulated quantities of hazardous materials shall comply with the following within 30 days of commencing operations:

   Operator must complete an electronic submittal to California Environmental Reporting System (CERS) and pay required permit fees.

3091 County Center Drive, #180, Auburn, CA 95603 ● wnicks@placer.ca.gov
530.745.2300 ● www.placer.ca.gov ● fax 530.745.2370

Perspective, Hope, and Opportunity

If the business will generate hazardous waste from routine operations, obtain an EPA ID number from the Department of Toxic Substances Control (DTSC).

Note: If the business owner/operator is unsure of what constitutes a hazardous material or waste, please contact Environmental Health Services for assistance at 530-745-2300.

6. Prior to Building Permit approval, installation, excavation, or breaking ground, contact the Environmental Health Services, Hazardous Materials Section, pay required fees, and secure appropriate permits and approvals to complete work on the underground storage tank system.

7. If at any time during the course of executing the proposed project, evidence of soil and/or groundwater contamination with hazardous material is encountered, the applicant shall immediately stop the project and contact Environmental Health Services Hazardous Materials Section. The project shall remain stopped until there is resolution of the contamination problem to the satisfaction of Environmental Health Services and to Central Valley Regional Water Quality Control Board. A note to this effect shall be added to the Improvement Plans where applicable.

8. The discharge of fuels, oils, or other petroleum products, chemicals, detergents, cleaners, or similar chemicals to the surface of the ground or to drainageways on, or adjacent to, the site is prohibited.

Placer County
AIR POLLUTION CONTROL DISTRICT

110 Maple Street, Auburn, CA 95603 • (530) 745-2330 • Fax (530) 745-2373 • www.placer.ca.gov/apcd

Erik C. White, Air Pollution Control Officer

June 21, 2017

SENT VIA E-MAIL: rking@loomis.ca.gov

Robert King
Town Planner
Town of Loomis
P.O. Box 1330
Loomis, CA 95650

SUBJECT: Notice of Preparation / Agency Notification for Costco Membership Warehouse

Mr. King,

Thank you for submitting the **Notice of Preparation / Agency Notification for Costco Membership Warehouse** (Project) to the Placer County Air Pollution Control District (District) for review and comment. This project documentation was received in the mail on June 8, 2017. The District provides the following comments for consideration.

1. The District's Board of Directors adopted CEQA Thresholds of Significance for criteria pollutants and Greenhouse Gas (GHG) on October 13, 2016. The following tables summarize the adopted thresholds:

Criteria Pollutant Thresholds								
Construction Phase			Operational Phase Project-Level			Operational Phase Cumulative-Level		
ROG	NOx	PM_{10}	ROG	NOx	PM_{10}	ROG	NOx	PM_{10}
(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)	(lbs/day)
82	82	82	55	55	82	55	55	82

Greenhouse Gas Thresholds			
Bright-line Threshold 10,000 MT CO2e/yr			
Efficiency Matrix			
Residential		Non-residential	
Urban	Rural	Urban	Rural
(MT CO2e/capita)		(MT CO2e/1,000sf)	
4.5	5.5	26.5	27.3
De Minimis Level 1,100 MT CO2e/yr			

The District recommends applying the District's adopted thresholds to determine the level of significance for the Project's related criteria pollutants and GHG impacts.

2. The District's California Environmental Quality Act (CEQA) Air Quality Handbook (Handbook) provides recommended analytical approaches and feasible mitigation measures when preparing air quality analyses for land use projects. The Handbook is available on the District's website at http://www.placer.ca.gov/departments/air/landuseceqa. Except where noted below additional detail relating to the following recommended items can be found within the Handbook.

   - The Project is located within the Sacramento Valley Air Basin (SVAB) and is under the jurisdiction of the District. The SVAB is designated as nonattainment for federal and state ozone (O_3) standards, nonattainment for the federal particulate matter standard ($PM_{2.5}$) and state particulate

matter standard (PM_{10}). Within the Air Quality section of the Initial Study, the District recommends the discussion include the area designations for the federal and state standards for the SVAB.

- The California Emissions Estimator Model (CalEEMod) is recommended when estimating the Project related air pollutants emissions from construction and operational phases. CalEEMod quantifies criteria pollutant emissions, including greenhouse gases (GHGs) from construction and operation (including vehicle use), as well as GHG emissions from energy production, solid waste handling, vegetation planting and/or removal, and water conveyance. In addition, CalEEMod calculates the benefits from implementing mitigation measures, including GHG mitigation measures, developed and approved by CAPCOA. During 2016, the CalEEMod Version 2016.3.1 was released which incorporates the California Air Resources Board's OFFROAD and EMFAC 2014 updates. No prior versions of CalEEMod should be used. Please contact the District for information on appropriate default settings applicable to the project area.

  The District requests copies of all modeling analysis files during the review of the DEIR for public review and comment.

- In the event the air quality analysis demonstrates the potential for the Project to cause or generate significant adverse air quality related impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. Additional mitigation measures can be found in the District's CEQA Handbook within the following related appendices.

  Appendix A. Recommended Mitigation Measures (Construction)

  Appendix B. District Rules and Regulations (Construction)

  Appendix C. Recommended Mitigation Measures (Operational)

  Appendix D. District Rules and Regulations (Operational)

  Appendix G. Mitigation Measures (Greenhouse Gases)

3. The District recommends a CALINE 4 modeling analysis for carbon monoxide (CO) concentration be performed and discussed within the environmental document if any intersection or roundabout is determined by the traffic study to degrade to a level of service "E" or "F" as a result of this project, alone or cumulatively; or where the total project-level CO emissions exceed 550 lbs/day.

4. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permits(s) from the District. The applicant, developer, or operator of a project that includes an generator, gasoline storage tanks should contact the District early to determine if a permit is required, and to begin the permit application process. Portable construction equipment (e.g. generators, compressors, pile drivers, lighting equipment, etc) with an internal combustion engine over 50 horsepower are required to have a PCAPCD permit or a California Air Resources Board portable equipment registration. The District recommends the following condition of approval for this Project.

   Processes that discharge 2 pounds per day or more of air contaminants, as defined by Health and Safety Code Section 39013, to the atmosphere may require a permit. Permits are required for both construction and operation. Developers/contractors should contact the District prior to construction and obtain any necessary permits prior to the issuance of a Building Permit. (Based on the California Health & Safety Code section 39013: http://www.leginfo.ca.gov/cgi-bin/displaycode?section=hsc&group=39001-40000&file=39010-39060

5. The Project requests approval of a gasoline facility which is a source of gasoline vapors that include Toxic Air Contaminants (TACs), primarily benzene[1]. Refueling at gasoline dispensing facilities releases benzene into the air. Benzene is a potent carcinogen and is one of the highest risk air pollutants regulated by the California Air Resources Board (ARB)[2]. The District recommends the environmental document describe the level of analysis, such as a Health Risk Assessment (HRA) or other modeling analysis, necessary to determine if the Project will have the potential to cause adverse health impacts.

[1] http://www.epa.gov/air/toxicair/newtoxics.html#effects
[2] http://www.arb.ca.gov/ch/handbook.pdf page 30

Prior to construction and operation of a gasoline facility, the applicant is required to obtain an Authority to Construct (ATC) permit from the District. A Health Risk Analysis is required as part of the ATC permit in order to determine the potential cancer risk that will be generated as a result of the project. The District reviews the proposed facility's preliminary health risk assessment of TACs emitted to determine the potential increased cancer risk. The District applies a Significance Risk Threshold for probability of cancer of 10 in a million, as well as a health index number of one (1) for non-carcinogens (based on a screening level analysis or computer modeling). All gasoline dispensing facilities with storage tanks over 250 gallons in size are required to install certified vapor recovery equipment. Additionally, the annual amount of gasoline dispensed from the facility will be limited to below the significance threshold for cancer risk of 10 in one million as demonstrated by the health risk assessment.

A Permit to Operate is then granted by the District, after the operator has demonstrated compliance with all District Rules and Regulations within the ATC permit. The Permit to Operate contains the parameters within which the facility may operate and is renewed annually to ensure compliance with all local, state, and federal air pollution control requirements.

Thank you for allowing the District this opportunity to review the project proposal. Please do not hesitate to contact me at 530.745.2327 or ahobbs@placer.ca.gov if you have any questions.

Sincerely,

Ann Hobbs
Air Quality Specialist
Planning & Monitoring Section

cc: Yushuo Chang, Planning & Monitoring Section Supervisor

MIWOK MAIDU United Auburn Indian Community of the Auburn Rancheria

Gene Whitehouse, Chairman | John L. Williams, Vice Chairman | Calvin Moman, Secretary | Jason Camp, Treasurer | Gabe Cayton, Council Member

RECEIVED
JUN 19 2017
TOWN OF LOOMIS

May 30, 2017

Bob King
Town of Loomis
3665 Taylor Road
Loomis, CA 95650

Subject: Notice of Preparation of a Draft Environmental Impact Report for the Costco Warehouse and Fuel Facility Project

Dear Bob King,

Thank you for requesting information regarding the above referenced project. The United Auburn Indian Community (UAIC) of the Auburn Rancheria is comprised of Miwok and Southern Maidu (Nisenan) people whose tribal lands are within Placer County and whose service area includes El Dorado, Nevada, Placer, Sacramento, Sutter, and Yuba counties. The UAIC is concerned about development within its aboriginal territory that has potential to impact the lifeways, cultural sites, and landscapes that may be of sacred or ceremonial significance. We appreciate the opportunity to comment on this and other projects. The UAIC would like to consult on this project.

In order to ascertain whether the project could affect cultural resources that may be of importance to the UAIC, we would like to receive copies of any archaeological reports that are completed for the project. We also request copies of environmental documents for the proposed project so that we have the opportunity to comment on appropriate identification, assessment and mitigation related to cultural resources. We recommend UAIC tribal representatives observe and participate in all cultural resource surveys. If you are interested, the UAIC's preservation department offers a mapping, records and literature search services program that has been shown to assist project proponents in complying with the necessary resource laws and choosing the appropriate mitigation measures or form of environmental documentation during the planning process.

The UAIC's preservation committee would like to set up a meeting or site visit, and begin consulting on the proposed project. Based on the preservation committee's identification of cultural resources in and around your project area, UAIC recommends that a tribal monitor be present during any ground disturbing activities. Thank you again for taking these matters into consideration, and for involving the UAIC early in the planning process. We look forward to reviewing the documents requested above and consulting on your project. Please contact Marcos Guerrero, Cultural Resources Manager, at (530) 883-2364 or by email at mguerrero@auburnrancheria.com if you have any questions.

Sincerely,

Gene Whitehouse,
Chairman

CC: Marcos Guerrero, CRM

Tribal Office 10720 Indian Hill Road Auburn, CA 95603 (530) 883-2390 FAX (530) 883-2380

PLACER COUNTY
FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Ken Grehm, Executive Director
Brian Keating, District Manager
Brad Brewer, Development Coordinator

June 14, 2017

Robert King
Town of Loomis Planning Department
P.O. Box 1327
Loomis, CA 95650

RE: Costco Membership Warehouse/Notice of Preparation of a Draft EIR

Robert:

We have reviewed the Notice of Preparation of a Draft EIR for the subject project and have the following comments.

The proposed Costco Membership Warehouse has the potential to create the following impacts:

a.) Increases in peak flow runoff downstream of the project site.

b.) Overloading of the actual or designed capacity of existing stormwater and flood-carrying facilities.

Future EIRs must specifically quantify the incremental effects of each of the above impacts due to the subject project and propose mitigation measures if necessary.

Please call me at (530) 745-7541 if you have any questions regarding these comments.

Brad Brewer, M.S., P.E., QSD/P
Development Coordinator

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3091 County Center Drive, Suite 220 / Auburn, CA 95603 / Tel: (530) 745-7541 / Fax: (530) 745-3531

Robert King

From: George Blind [gblind1@gmail.com]
Sent: Friday, June 16, 2017 3:02 PM
To: Robert King
Subject: EIR - COSTCO

Robert: The Loomis Fire District has no special concerns regarding the EIR for the proposed COSTCO warehouse. The facility will be constructed to comply with the requirements contained in Title 24, California Administrative Code and Loomis Fire District amendments to the California Fire Code. Adequate water supply should be available from PCWA.

Please contact me if you have any questions as the project proceeds.

George Blind
Loomis Fire District
916 759-4094

Robert King

From: Brad Brewer [BBrewer@placer.ca.gov]
Sent: Wednesday, June 14, 2017 12:57 PM
To: Robert King
Cc: Tracie Coyle
Subject: Costco NOP FCD Comments
Attachments: cn17-65 Costco NOP.pdf

Good afternoon Robert:
Please find attached our comments regarding the subject project.

Thanks,

J. Brad Brewer, M.S., P.E., QSD/P
Development Review Coordinator
Placer County Flood Control and Water Conservation District
3091 County Center Drive, Suite 220
Auburn, CA 95603
Phone: 530-745-7541
Fax: 530-745-3531

Robert King

From: Kathryn von Seeburg [KvonSeeburg@recology.com]
Sent: Monday, May 22, 2017 12:17 PM
To: Robert King
Subject: Costco Membership Warehouse

Recology Auburn Placer has no questions or concerns about the project at this time. However, we will want to review plans for refuse disposal as the project moves forward. Please let me know if you have questions or need additional information.

Hope all is well!

Kathryn von Seeburg
Office Manager

Recology™ Auburn Placer
12305 Shale Ridge Road | P.O. Box 6566 | Auburn, CA 95604
T: 530.885.3735
kvonseeburg@recology.com

WASTE ZERO

Appendix B CalEEMod Air Quality Emissions Modeling & Health Risk Assessment

CalEEMod Air Quality Emissions Modeling

Construction Emissions Summary

Summary of Modeled Maximum Daily Construction-Related Emissions of Criteria Air Pollutants and Precursors			
Portion of Construction Phase	Maximum Daily Emissions (lb/day)		
	VOC	NO_X	PM_{10}
Rough Grade	6.5	76.1	12.9
Base for Paving	6.8	29.8	1.7
Paving - Asphalt	6.3	19.5	1.2
Concrete Foundation / Slab on Grade	4.2	23.5	1.4
Building Erection	*3.8*	*35.5*	*3.5*
Architectural Coating	*80.0*	*2.4*	*0.5*
Maximum daily emissions	**80.0**	**76.1**	**12.9**
PCAPCD significance threshold	**82**	**82**	**82**
Exceeds Threshold?	**No**	**No**	**No**

Notes: lb/day = pounds per day; NO_x = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; VOC = volatile organic compounds; PCAPCD = Placer County

Source: AECOM 2019; See Appendix X for detailed modeling assumptions, outputs, and results.

Daily Construction Emissions Detailed - (lbs/day):

Phase	ROG	NOX	PM10 (Total)	PM10 Exhaust	PM2.5 Exhaust
Rough Grade	6.518	76.1018	12.9156	3.0	2.8
On-Site	5.9785	62.5315	11.8518	2.9196	2.7246
Off-Site	0.5395	13.5703	1.0638	0.1	0.1
Base for Paving	6.7619	29.7766	1.7036	0.8	0.7
On-Site	6.2406	15.0626	0.6908	0.6908	0.6355
Off-Site	0.5213	14.714	1.0128	**0.0661**	**0.0632**
Paving - Asphalt	6.3361	19.4584	1.1678	0.6817	0.7658
On-Site	6.0739	12.7943	0.6515	0.6515	0.5994
Off-Site	0.2622	6.6641	0.5163	0.0	0.2
Concrete Foundataions/Slab or	4.2485	23.5018	1.3627	0.8485	0.7818
On-Site	3.9711	16.3642	0.8172	0.8162	**0.7509**
Off-Site	0.2774	7.1376	0.5455	0.0	0.0309
Building Erection	3.82	35.502	3.5131	1.5375	1.415
On-Site	2.9013	32.5351	1.5153	**1.5153**	1.4
Off-Site	0.9175	2.9669	1.9978	0.0222	0.0209
Arch. Coating	80.0114	2.3655	0.5199	0.15025	0.15006
On-Site	79.8424	2.2451	0.1479	0.1	0.1479
Off-Site	0.169	0.1204	0.372	0.00235	0.00216

Total Construction Emissions Detailed Options (tons):

	Unmitigated	
Phase	ROG	PM2.5 Exhaust
Rough Grade	0.1624	0.06955
On-Site	0.1495	0.0681
Off-Site	1.29E-02	0.00145
Base for Paving		
On-Site	0.0156	0.00159
Off-Site	1.25E-03	0.00015
Paving - Asphalt	0.00083	1.00E-05
On-Site	1.52E-02	1.50E-03
Off-Site	6.30E-04	7.00E-05
Concrete Foundataions/Slab or	2.29E-02	1.48E-03
On-Site	1.99E-02	3.75E-03
Off-Site	1.33E-03	1.50E-04
Building Erection	4.80E-04	2.00E-05
On-Site	2.90E-02	1.39E-02
Off-Site	8.50E-03	2.10E-04
Arch. Coating	5.70E-04	1.00E-05
On-Site	7.98E-01	1.48E-03
Off-Site	1.56E-03	2.00E-05

Total (6 month construction duration) (tons):	Unmitigated	
	ROG (tons)	PM2.5 Exhaust (tons)
On-Site (Off-Road Equip/Vehicl	1.0276	9.03E-02
Off-Site (Mobile)*	2.62E-02	2.05E-03

Scaled for 12-months (1-Year)	Unmitigated	
HARP2 Inputs	ROG (tons)	PM2.5 Exhaust (lb/yr)
On-Site (Off-Road Equip/Vehicl	4110.4	3.61E+02
Off-Site (Mobile)	1.05E+02	8.20E+00

NOT SCALED	Unmitigated	
HARP2 Inputs	ROG (tons)	PM2.5 Exhaust (lb/yr)
On-Site (Off-Road Equip/Vehicl	2055.2	1.81E+02
Off-Site (Mobile)	5.23E+01	4.10E+00

Operational Emissions Summary

Summary of CalEEMod Modeled Maximum Daily Long-Term Operational Emissions of Criteria Air Pollutants and Precursors[1]

Emissions Source	Daily Emissions (lbs/day)		
	ROG	NO_X	PM_{10}
Area	4.00	9.20E-04	3.60E-04
Energy	0.06	0.51	0.04
Mobile	5.03	36.76	12.15
Fueling Center	28.05	-	-
Total Daily Operational Emissions[2]	**37**	**37**	**12**
PCAPCD Thresholds of Significance	**55**	**55**	**82**
Exceeds Thresholds?	**No**	**No**	**No**

Notes: lbs/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; PCAPCD = Placer County Air Pollution Control District.

[a] Operational emissions were modeled for year 2018.
[b] Includes emissions from delivery truck (warehouse and fueling center) idling and TRU emissions during deliveries.
[c] Assumes reactive organic gases associated with gasoline dispensing = total organic gases. Based on CARB's Revised Emission Factors report, December 23, 2013 : https://www.arb.ca.gov/vapor/gdf-emisfactor/gdf%20umbrella%20document%20-%2020%20nov%202013.pdf
[d] Total emissions may not add correctly due to rounding.

Source: AECOM 2019; See Appendix X for detailed modeling assumptions, outputs, and results.

HRA Summary:

a. PM2.5 exhaust and ROG for gasoline deliveries and warehouse deliveries. We'd need this broken out for each. I'm assuming it would be similar to your idling calculation with different emission factors.
b. ROG for customer and worker traffic. A total number is fine. We will be dividing this out based on the traffic turn movements in the TIS.

	Emissions (lb/day)		Emissions (tpy)		Distance (one-way per trip)*
	ROG	PM2.5 (Exhaust)	ROG	PM2.5 (Exhaust)	
Mobile Operations:					
Warehouse Deliveries - Truck Operations	0.143547158	0.018718625	0.026197356	0.003416149	10
Warehouse Deliviers - TRU Operations	0.053687614	0.020456216	0.00979799	0.003733259	10
Fuel Deliveries	0.082081192	0.03072618	0.014979818	0.005607528	10
Customer/Worker Commutes	4.20	0.17	0.77	0.0296	see "Operational Trip Rate Calcs" tab
On-Site Idling:					
Warehouse Deliveries	5.16	0.03	4.15E+00	2.32E-02	-
Fuel Deliveries	2.67	0.05	2.15E+00	3.92E-02	-
TRUs	4.06	1.55	3.27E+00	1.24E+00	-

** Note that trip distanc and duration are based on travel within Placer County for trucks travelling to Loomis from Tracy and West Sacramento. Additional miles travelled outside of the county and air district will be incurred and are separately ccounted for and discussed.*

GHG Emissions Summary

Emissions Source	GHG Emissions ($MTCO_2e$ / year)
Construction GHG Emissions	
Maximum Annual Construction Emissions	385
Operational GHG Emissions	
Area	0.018
Energy	678
Mobile[1]	5095
Waste	343
Water	42
Total Annual Operational Emissions	**6159**
Total[3] Annual Operational + Amortized Construction Emissions	**6,178**
Total[3] Annual Project Emissions per 1,000 Square Feet[3]	**39.73**
PCAPCD GHG Efficiency Threshold	***27.3***

Notes:

[1] Mobile emissions calculations include those calculated in CalEEMod based upon VMT projected in the Transportation Impact Analysis for customer and worker trips, plus those calculated using EMFAC 2017 and OFFROAD 2017 Emissions Inventory for fuel and warehouse delivery truck trips and on-site idling.

[2] Annual Operational EMissions per 1,000 square feet calculated based upon approximate warehouse size of 155,000 sq. ft.

Source: Modeled by AECOM in 2019

Energy Summary

Phase	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction (amortized over 20 years)			
Diesel	1,778	Gallons/yr	245
Gasoline	134	Gallons/yr	17
		Subtotal	*262*
Building Operations			
Warehouse			
Electrical	1,827,450	KWh/yr	6,237
Natural Gas	1,813,500	kBTU/yr	1,814
Fueling Center			
Electrical	35,788	KWh/yr	122
Natural Gas	78,945	kBTU/yr	79
Parking			
Electrical	108,920	KWh/yr	372
Natural Gas	-	kBTU/yr	-
		Subtotal	*8,623*
Operational Transportation			
Diesel	114,698	Gallons/yr	15,839
Gasoline	437,834	Gallons/yr	54,729
		Subtotal	*70,568*
		Total	***79,454***

Notes:

Totals do not add due to rounding.

Source: Modeled by AECOM in 2019

Conversion Factors

Category	Amount	Units	
Diesel (heat content)	5.8	MMBtu/barrel	http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf
Motor Gasoline	5.25	MMBtu/barrel	http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf
Natural Gas	0.1	MMBtu/therm	https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references
Propane	0.0913	MMBtu/gallon	https://www.eia.gov/environment/emissions/co2_vol_mass.php
Kerosene	0.135	MMBtu/gallon	https://www.eia.gov/environment/emissions/co2_vol_mass.php
Wood	20	MMBtu/cord	https://www.eia.gov/energyexplained/index.cfm?page=about_btu
Gallons per Barrel	42	gallons/barrel	http://www.theclimateregistry.org/wp-content/uploads/2017/05/2017-Climate-Registry-Default-Emission-Factors.pdf

Town of Loomis BAU Energy Use Forecast	2005 Energy Use (Units listed in category to left)	2020 Forecast Energy Use (Units listed in category to left)	2005 Energy Use (MMBtu)	2020 Forecast Energy Use (MMBtu)
Residential				
Electricity (kWh)	23,909,871	27,274,491	81,604	93,088
Natural Gas (Therms)	989,949	1,129,270	98,995	112,927
Propane (Gallons)	154,915	176,717	14,148	16,139
Fuel Oil/Kerosene (Gallons)	6,855	7,819	924	1,054
Wood (Cords)	156	178	3,120	3,560
Non-Residential				
Electricity (kWh)	24,371,091	26,894,177	83,179	91,790
Natural Gas (Therms)	316,564	349,330	31,656	34,933
		Total	313,627	353,491

Operational Emissions - CalEEMod Output

Emissions Source	Daily Emissions (lbs/day)			
	ROG	NO_X	PM_{10}	PM2.5 Exhaust
Area	4.00	9.20E-04	3.60E-04	3.60E-04
Energy	0.06	0.51	0.04	0.04
Mobile	4.20	29.76	11.94	0.17
Total	8.26	30.27	11.98	2.07E-01

Emissions Source	Annual Emissions (tons/yr)			
	ROG	NO_X	PM_{10}	PM2.5 Exhaust
Area	0.73	8.00E-05	3.00E-05	3.00E-05
Energy	0.01	9.28E-02	7.05E-03	7.05E-03
Mobile	0.77	5.24E+00	2.03E+00	2.96E-02
Waste	0.00	0.00	0.00	0.00
Water	0.00	0.00	0.00	0.00
Total	1.51	5.33	2.04	3.67E-02

Fueling Station Operational ROG Emissions	
Annual Throughput (gallons)	20,000,000
Average Daily Throughput (gallongs)	54,795
ROG Emissions Factor (lbs/kgal)	0.51183
Daily ROG Emissions (lbs/day)	28.05

Reactive Organic Gas Emissions Factors for Gasoline Dispensing Facilities

Losses	Emission Factor (lbs/kgal)[a]
Phase I Bulk Transfer Losses	0.15
Pressure Driven Losses	0.024
Phase II Fueling	0.0888
Phase II Fueling - Spillage	0.24
Hose Permeation	0.009
Total	0.51183

[a] Based on CARB's Revised Emission Factors report, December 23, 2013 : https://www.arb.ca.gov/vapor/gdf-emisfactor/gdf%20umbrella%20document%20-%2020%20nov%202013.pdf

Assumes reactive organic gases associated with gasoline dispensing = total organic gases.
Notes: lbs/kgal = pounds per 1,000 gallongs fuel

Derivation of Phase II Fueling Emission Factor

	Percent of CA Vehicle Fleet in 2018[a]	Emission Factor (lbs/kgal)[b]
ORVR Vehicles	83%	0.021
Non-ORVR Vehicles	17%	0.42
Composite	100%	0.0888

[a] Figure 1 from Staff Report ISOR for Public Hearing to Consider the Proposed Amendments to California Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks (Sep 4 2018): https://www.arb.ca.gov/regact/2018/fillpipe2018/fpisor.pdf
[b] Table I-I from CARB's Revised Emission Factors report, December 23, 2013 : https://www.arb.ca.gov/vapor/gdf-emisfactor/gdf%20umbrella%20document%20-%2020%20nov%202013.pdf

Notes: lbs/kgal = pounds per 1,000 gallongs fuel; ORVR = On-board Refueling Vapor Recovery

Delivery Truck and TRU On-Road Emissions

			Emission Factors (g/mile)								
Emissions Source	**Year**	**Vehicle Class**	**ROG**	**NO_X**	**CO**	**$PM_{10\ (Total)}$**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**CO_2**	**CH4**	**N2O**
Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	Aggregate	T7 Other Port	0.250	6.058	0.896	0.132	0.033	0.068	1862.925	0.01163184	0.74354419
Heavy-Heavy Duty Diesel Single Unit Truck (Fuel Delivery)	Aggregate	T7 Single - Diesel	0.266	5.477	0.852	0.202	0.100	0.135	1588.354	0.01235216	0.82288794
			Emission Factors (g/hr)*								
TRU - Instate Truck TRU	Aggregate	TRU - Instate Truck TRU	6.09	59.07	48.70	2.52	2.32	2.32	1166.20	0.00071871	0.00032783

*Emission factors for T7 trucks are from EMFAC 2017 tab; Emission factors for TRUs are from OFFROAD 2017 tab.

Global Warming Potential	
CO2	1
CH4	28
N2O	265

*Per IPCC 5th Assessment Report (AR5)

Conversion Factors:	
grams per pound:	453.59237
pounds per ton:	2000

Phase II Mobile Emissions:

Within Placer County Air Pollution Control District

			Emissions (lb/day)						Emissions (tons/year)						
Vehicle Type	**Trucks per Day**	**One-Way Trip Distance (miles)***	**ROG**	**NO_X**	**CO**	**$PM_{10\ (Total)}$**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**CO_2e**
Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	13	10	0.144	3.473	0.514	0.076	0.019	0.039	0.026	0.634	0.094	0.014	0.003	0.007	215.526
Heavy-Heavy Duty Diesel Single Unit Truck (Fuel Delivery)	7	10	0.082	1.691	0.263	0.062	0.031	0.042	0.015	0.309	0.048	0.011	0.006	0.008	101.772
	Trucks per Day	**Estimated Hours per One-Way Trip***													
TRU - Instate Truck TRU	4	0.5	0.054	0.521	0.429	0.022	0.020	0.020	0.010	0.095	0.078	0.004	0.004	0.004	1.877
Total Emissions			0.279	5.684	1.206	0.160	0.070	0.101	0.051	1.037	0.220	0.029	0.013	0.018	319.174

* Note that trip distanc and duration are based on travel within Placer County for trucks travelling to Loomis from Tracy and West Sacramento. Additional miles travelled outside of the county and air district will be incurred and are separately ccounted for and discussed.

Within Sacramento Metropolitan Air Quality Management District

			Emissions (lb/day)						Emissions (tons/year)						
Vehicle Type	**Trucks per Day**	**One-Way Trip Distance (miles)***	**ROG**	**NO_X**	**CO**	**$PM_{10\ (Total)}$**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**CO_2e**
Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	13	40	0.574	13.891	2.054	0.302	0.075	0.156	0.105	2.535	0.375	0.055	0.014	0.029	862.102
Heavy-Heavy Duty Diesel Single Unit Truck (Fuel Delivery)	7	20	0.164	3.381	0.526	0.125	0.061	0.083	0.030	0.617	0.096	0.023	0.011	0.015	203.543
	Trucks per Day	**Estimated Hours per One-Way Trip***													
TRU - Instate Truck TRU	4	1	0.107	1.042	0.859	0.044	0.041	0.041	0.020	0.190	0.157	0.008	0.007	0.007	3.754
Total Emissions			0.846	18.314	3.439	0.471	0.177	0.280	0.154	3.342	0.628	0.086	0.032	0.051	1069.400

* Note that trip distanc and duration are based on travel within Sacramento County for trucks travelling from Tracy and West Sacramento to Loomis. Additional miles travelled outside of the county and air district will be incurred and are separately ccounted for and discussed.

Within San Joaquin Valley Air Pollution Control District

			Emissions (lb/day)						Emissions (tons/year)						
Vehicle Type	**Trucks per Day**	**One-Way Trip Distance (miles)***	**ROG**	**NO_X**	**CO**	**$PM_{10\ (Total)}$**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**ROG**	**NO_X**	**CO**	**PM_{10}**	**$PM_{2.5\ (Exhaust)}$**	**$PM_{2.5\ (Total)}$**	**CO_2e**
Heavy-Heavy Duty Diesel Drayage Truck at Other Facilities	13	50	0.718	17.364	2.568	0.378	0.094	0.195	0.131	3.169	0.469	0.069	0.017	0.036	1077.628
Heavy-Heavy Duty Diesel Single Unit Truck (Fuel Delivery)	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Trucks per Day	**Estimated Hours per One-Way Trip***													
TRU - Instate Truck TRU	4	1	0.107	1.042	0.859	0.044	0.041	0.041	0.020	0.190	0.157	0.008	0.007	0.007	3.754
Total Emissions			0.825	18.405	3.427	0.422	0.135	0.236	0.151	3.359	0.625	0.077	0.025	0.043	1081.382

* Note that trip distanc and duration are based on travel within San Joaquin County for trucks travelling from Tracy to Loomis. Additional miles travelled outside of the county and air district will be incurred and are separately ccounted for and discussed.

* Costco trucks typically travelling from distribution warehouse in Tracy, CA (95 miles)
* Fuel assumed to be supplied by refined products terminal in West Sacramento (30 miles)

Delivery Truck, Transport Refrigeration Units (TRUs), and Fueling Station Customer On-Site Idling Emissions

On-Site Idling:

			Emissions (g/day)						MT/yr
Activity	**Number of Vehicles per Day**	**Duration per Load (hours)**	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Truck Idling (no TRU)	9	0.2	3.57	62.18	37.18	0.10	0.02	0.02	0.01
Truck Idling (with TRU)	4	0.2	1.59	27.63	16.53	0.04	0.01	0.01	0.00
TRU emissions	4	0.2	4.06	39.38	32.47	0.01	1.68	1.55	0.00
Gasoline Delivery Trucks	7	0.2	2.67	38.32	33.91	0.06	0.05	0.05	0.01
Fueling Center Vehicles in Queue Line	30	1.0	237.21	428.13	5351.24	18.98	20.34	18.70	1.93
Total			249.09	595.64	5471.32	19.19	22.10	20.33	1.95

Emissions for truck idling using EMFAC 2011 idling emission rates provided in g/hr-vehicle (https://www.arb.ca.gov/msei/emfac2011_idling_emission_rates.xlsx)
Emissions for TRU emissions using OFFROAD 2017 emissions rates.

HARP2 Modeling

			Emissions (lb/yr)					
Activity			**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Truck Idling (no TRU) [b]			2.87E+00					1.61E-02
Truck Idling (with TRU) [c]			1.28E+00					7.14E-03
TRU emissions			3.27E+00					1.24E+00
Gasoline Delivery Trucks			2.15E+00					3.92E-02
Fueling Center Passenger Vehicles			1.91E+02					N/A

g --> lb	0.002205
day --> yr	365

			Emission Factors (g/vehicle/day)								
Vehicle Category	**Model Year**	**Fuel**	**ROG_IDLEX**	**NOx_IDLEX**	**CO_IDLEX**	**SOx_IDLEX**	**PM10_IDLEX**	**PM2_5_IDLEX**	**CO2_IDLEX**	**CH4_IDLEX**	**N2O_IDLEX**
T7 other port	Aggregated	DSL	1.642470989	28.601113	17.1039243	0.044689944	0.009601146	0.009185805	4730.34392	0.076288523	0.7435442
T7 Single	Aggregated	DSL	2.102446975	30.216413	26.73723881	0.049458817	0.040094723	0.038360243	5235.119855	0.097653217	0.8228879

*Source: EMFAC 2017

		Emission Factors (g/vehicle/idle-hr)								
Vehicle Category	**idle--hour factor**	**ROG_IDLEX**	**NOx_IDLEX**	**CO_IDLEX**	**SOx_IDLEX**	**PM10_IDLEX**	**PM2_5_IDLEX**	**CO2_IDLEX**	**CH4_IDLEX**	**N2O_IDLEX**
T7 other port	0.69	2.380392737	41.450889	24.78829609	0.064768035	0.013914705	0.013312761	6855.570898	0.110563077	1.0776003
T7 Single - model year 2008+	0.92	2.285268451	32.843927	29.0622161	0.053759583	0.04358122	0.041695916	5690.347669	0.106144801	0.8944434

*Source: Table 4.4-9 EMFAC2017 Idle Hours for Selected Categories from ARB emfac2017 value iii technical documentation (https://www.arb.ca.gov/msei/downloads/emfac2017-volume-iii-technical-documentation.pdf)

Passenger Vehicle Fueling Emission Factors

			Emission Factors (g/vehicle/hr)								
Vehicle Category	Model Year	Fuel	**ROG**	**Nox**	**CO**	**SOx**	**PM10**	**PM2.5**	**CO2**	**CH4**	**N2O**
Light- and Medium-Duty Cars and Trucks	Aggregate	Gas	0.790708693	1.4271027	17.83745685	0.063278671	0.067792005	0.062342143	6394.490907	0.182981835	0.1164353

Global Warming Potential	
CO2	1
CH4	28
N2O	265

*Per IPCC 5th Assessment Report (AR5)

Conversion Factors:	
grams per pound:	453.59237
pounds per metric ton:	2204

Estimated Annual Fuel Consumption for Proposed Project Operations

Fuel Type	Total Project Mobile GHG Emissions (MT CO2e/yr) [a]	% Average Fleet Mix [b]	Factor (MT CO_2/gallon) [c]	Fuel Consumption (Gallons/year)
	5,095.23			
Diesel		22.87%	1.02E-02	114,698
Gasoline		76.37%	8.89E-03	437,834

Sources:
[a] Modeled by AECOM in 2019;
[b] EMFAC2017 (v1.0.1) Web Database
[c] U.S. Energy Information Administration 2016 (https://www.eia.gov/environment/emissions/co2_vol_mass.php)

EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Placer (SV)
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	% VMT
Placer (SV)	2020	All Other Buses	Aggregated	Aggregated	DSL	32.87661	1862.975195	276.1635	0.03%
Placer (SV)	2020	LDA	Aggregated	Aggregated	GAS	85747.77	3138629.859	404629.5	43.80%
Placer (SV)	2020	LDA	Aggregated	Aggregated	DSL	978.5756	36279.83901	4598.804	0.51%
Placer (SV)	2020	LDA	Aggregated	Aggregated	ELEC	1332.311	50647.13622	6641.155	0.71%
Placer (SV)	2020	LDT1	Aggregated	Aggregated	GAS	11722.04	446126.9644	53927.48	6.23%
Placer (SV)	2020	LDT1	Aggregated	Aggregated	DSL	12.06071	160.7347793	41.0205	0.00%
Placer (SV)	2020	LDT1	Aggregated	Aggregated	ELEC	34.98558	1276.174539	171.5239	0.02%
Placer (SV)	2020	LDT2	Aggregated	Aggregated	GAS	41048.12	1607844.062	191799.4	22.44%
Placer (SV)	2020	LDT2	Aggregated	Aggregated	DSL	205.2079	9936.712557	1012.003	0.14%
Placer (SV)	2020	LHD1	Aggregated	Aggregated	GAS	176.1307	5911.579147	895.335	0.08%
Placer (SV)	2020	LHD1	Aggregated	Aggregated	DSL	3417.668	118697.9814	50918.16	1.66%
Placer (SV)	2020	LHD2	Aggregated	Aggregated	GAS	4360.634	149376.5753	54851.29	2.08%
Placer (SV)	2020	LHD2	Aggregated	Aggregated	DSL	465.3321	16632.97628	6932.755	0.23%
Placer (SV)	2020	MCY	Aggregated	Aggregated	GAS	1329.133	48742.4774	16718.82	0.68%
Placer (SV)	2020	MDV	Aggregated	Aggregated	GAS	6300.241	37110.34281	12600.48	0.52%
Placer (SV)	2020	MDV	Aggregated	Aggregated	DSL	31989.5	1072452.682	147435.8	14.96%
Placer (SV)	2020	MH	Aggregated	Aggregated	GAS	725.5634	28798.61223	3513.886	0.40%
Placer (SV)	2020	MH	Aggregated	Aggregated	DSL	55.45225	1890.705789	282.9537	0.03%
Placer (SV)	2020	Motor Coach	Aggregated	Aggregated	DSL	911.7509	7827.108894	91.21156	0.11%
Placer (SV)	2020	OBUS	Aggregated	Aggregated	GAS	426.1785	3767.518974	42.61785	0.05%
Placer (SV)	2020	PTO	Aggregated	Aggregated	DSL	10.08511	1287.083844	147.2426	0.02%
Placer (SV)	2020	SBUS	Aggregated	Aggregated	GAS	82.49271	3488.304158	1650.514	0.05%
Placer (SV)	2020	SBUS	Aggregated	Aggregated	DSL	0	3854.492898	0	0.05%
Placer (SV)	2020	T6 Ag	Aggregated	Aggregated	DSL	14.8531	606.4978458	59.41239	0.01%
Placer (SV)	2020	T6 CAIRP heavy	Aggregated	Aggregated	DSL	254.9563	7966.771898	2942.16	0.11%
Placer (SV)	2020	T6 CAIRP small	Aggregated	Aggregated	DSL	18.18819	3612.069847	265.5476	0.05%
Placer (SV)	2020	T6 instate construction heavy	Aggregated	Aggregated	DSL	11.03984	595.974764	161.1816	0.01%
Placer (SV)	2020	T6 instate construction small	Aggregated	Aggregated	DSL	41.9765	2853.905129	189.7741	0.04%
Placer (SV)	2020	T6 instate heavy	Aggregated	Aggregated	DSL	295.5068	15085.57302	1335.975	0.21%
Placer (SV)	2020	T6 instate small	Aggregated	Aggregated	DSL	392.4762	60081.81437	4529.121	0.84%
Placer (SV)	2020	T6 OOS heavy	Aggregated	Aggregated	DSL	1665.841	91351.41849	19223.58	1.27%
Placer (SV)	2020	T6 OOS small	Aggregated	Aggregated	DSL	10.30936	2049.561944	150.5166	0.03%
Placer (SV)	2020	T6 Public	Aggregated	Aggregated	DSL	5.453591	284.8556725	79.62242	0.00%
Placer (SV)	2020	T6 utility	Aggregated	Aggregated	DSL	311.2418	4869.639005	944.1002	0.07%
Placer (SV)	2020	T6TS	Aggregated	Aggregated	GAS	29.94257	499.7586743	344.3395	0.01%
Placer (SV)	2020	T7 Ag	Aggregated	Aggregated	DSL	222.6318	10159.95462	4454.418	0.14%
Placer (SV)	2020	T7 CAIRP	Aggregated	Aggregated	DSL	196.1152	35506.03523	2863.281	0.50%
Placer (SV)	2020	T7 CAIRP construction	Aggregated	Aggregated	DSL	11.14562	2049.984845	50.38892	0.03%
Placer (SV)	2020	T7 NNOOS	Aggregated	Aggregated	DSL	214.503	43295.97996	3131.743	0.60%
Placer (SV)	2020	T7 NOOS	Aggregated	Aggregated	DSL	77.06655	13946.31586	1125.172	0.19%
Placer (SV)	2020	T7 other port	Aggregated	Aggregated	DSL	2.444744	388.9158154	18.58005	0.01%
Placer (SV)	2020	T7 POAK	Aggregated	Aggregated	DSL	10.09934	1128.165741	76.75501	0.02%
Placer (SV)	2020	T7 Public	Aggregated	Aggregated	DSL	279.332	5659.82949	847.3071	0.08%
Placer (SV)	2020	T7 Single	Aggregated	Aggregated	DSL	267.0645	19411.99668	3081.887	0.27%
Placer (SV)	2020	T7 single construction	Aggregated	Aggregated	DSL	72.10768	5085.635347	325.996	0.07%
Placer (SV)	2020	T7 SWCV	Aggregated	Aggregated	DSL	153.4641	6258.695704	598.5099	0.09%
Placer (SV)	2020	T7 tractor	Aggregated	Aggregated	DSL	195.7484	27014.0792	2486.005	0.38%
Placer (SV)	2020	T7 tractor construction	Aggregated	Aggregated	DSL	59.69658	4195.201418	269.8859	0.06%
Placer (SV)	2020	T7 utility	Aggregated	Aggregated	DSL	5.811285	117.9413884	66.82977	0.00%
Placer (SV)	2020	T7IS	Aggregated	Aggregated	GAS	1.028437	81.3138809	20.57697	0.00%
Placer (SV)	2020	UBUS	Aggregated	Aggregated	GAS	28.95239	2327.874715	115.8096	0.03%
Placer (SV)	2020	UBUS	Aggregated	Aggregated	DSL	45.99606	4573.352307	183.9842	0.06%
Placer (SV)	2021	UBUS	Aggregated	Aggregated	NG	24.38584	2749.016108	97.54338	0.04%
							7166411.028		

DSL	22.87%
GAS	76.37%

Construction Energy Consumption

Phase	Source	MT CO_2e/yr [a]	Fuel Type	Emission Factor (MT CO_2/gallon) [b]	Gallons/year
Rough Grade	Offroad Equip	178.21	Diesel	0.01016	17,541
	Hauling	0.00	Diesel	0.01016	-
	Vendor	78.77	Diesel	0.01016	7,753
	Worker	4.75	Gas	0.008887	534
Base for Paving	Offroad Equip	4.51	Diesel	0.01016	444
	Hauling	0.00	Diesel	0.01016	-
	Vendor	8.57	Diesel	0.01016	843
	Worker	0.22	Gas	0.008887	25
Paving - Asphalt	Offroad Equip	4.03	Diesel	0.01016	396
	Hauling	0.00	Diesel	0.01016	-
	Vendor	3.87	Diesel	0.01016	381
	Worker	0.22	Gas	0.008887	25
Concrete Foundations / Slab on Grade	Offroad Equip	11.06	Diesel	0.01016	1,089
	Hauling	0.00	Diesel	0.01016	-
	Vendor	8.29	Diesel	0.01016	816
	Worker	0.44	Gas	0.008887	50
Building Erection	Offroad Equip	54.95	Diesel	0.01016	5,408
	Hauling	0.00	Diesel	0.01016	-
	Vendor	5.53	Diesel	0.01016	544
	Worker	15.19	Gas	0.008887	1,709
Architectural Coating	Offroad Equip	3.41	Diesel	0.01016	336
	Hauling	0.00	Diesel	0.01016	-
	Vendor	0.00	Diesel	0.01016	-
	Worker	3.05	Gas	0.008887	343
			Total Gallons	**Diesel**	**35,551**
				Gasoline	**2,686**
			Amortized Demands (over 20 years)	**Diesel**	**1,778**
				Gasoline	**134**

Notes:

Assumed amortization period is 20 years.

Sources:

[a] Modeled by AECOM in 2019;

[b] U.S. Energy Information Administration 2016 (https://www.eia.gov/environment/emissions/co2_vol_mass.php)

Amortization period (yrs):		20
Factor:	MT/gallon	
Diesel		1.02E-02
Gasoline		8.89E-03

Building Energy Consumption

Electricity Usage - Placer county 2016 (GWh)			Project Electicity Consumption (kWh/yr)	
County	Sector	Total Usage (GWh)	Warehouse	1,827,450
PLACER	Non-Residential	1536.053019	Fueling Center	35,788
PLACER	Residential	1402.456464	Parking	108,920
PLACER	Total	2938.509483	Total	1,972,157.90
*CEC 2017a (http://ecdms.energy.ca.gov/elecbycounty.aspx)			% of County	0.0671%

Natrual Gas Usage - Placer county 2016				Project Gas Consumption (kBTU/yr)	
County	Sector	Total Usage (Millions of Therms)	kBTU	Warehouse	1,813,500
PLACER	Non-Residential	28.746568	2874656800	Fueling Center	78,945
PLACER	Residential	62.184773	6218477300	Parking	-
PLACER	Total	90.931341	9,093,134,100.00	Total	1,892,445.10
*CEC 2017b (http://ecdms.energy.ca.gov/gasbycounty.aspx)				% of County	0.0208%

* 1,000,000 Therms = 100,000,000 kBTU

Table 3.5-3. Estimated Annual Electrical and Natural Gas Demand

Location	Electrical Demand (kWh/year)	Natural Gas Demand (kBtu/year)
Warehouse	1,827,450	1,813,500
Fueling Center	35,788	78,945
Parking	108,920	0
Total	**1,972,158**	**1,892,445**

Notes: kWh = kilowatt-hours; kBtu = thousand British thermal unit

Source: AECOM 2019

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
A	CH4_IDLEX	0	0	0	0	0.004947	0.003636	0.019644	1.039991	0.012708	0	0	0.867979	0
A	CH4_RUNEX	0.005745	0.014686	0.007808	0.014594	0.025343	0.012212	0.012996	0.009087	0.026799	1.219565	0.406204	0.026858	0.048803
A	CH4_STREX	0.010519	0.02752	0.014047	0.028104	0.021	0.009849	0.082468	0.237824	0.039564	0.0588	0.184938	0.129246	0.037365
A	CO_IDLEX	0	0	0	0	0.137141	0.118851	0.482219	4.197389	0.284421	0	0	5.998851	0
A	CO_RUNEX	0.75727	1.784002	1.013056	1.719341	1.648121	0.910044	0.802579	0.811727	1.616257	6.868239	24.0919	1.585035	4.844172
A	CO_STREX	2.005961	5.090873	2.758144	4.699779	2.810999	1.371414	7.422857	3.068069	8.522947	11.0688	10.65873	11.74022	7.956404
A	CO2_NBIO_IDLEX	0	0	0	0	9.600959	15.01518	180.6938	6635.93	79.52718	0	0	1264.424	0
A	CO2_NBIO_RUNEX	283.861	339.0135	390.3516	520.6193	697.2087	738.0212	1215.415	1648.162	1359.721	2057.899	162.3392	1152.534	1246.193
A	CO2_NBIO_STREX	64.96549	77.89859	89.92937	117.8341	26.79041	21.97194	45.56479	7.995365	72.7295	118.0161	49.29541	38.5683	62.82726
A	NOX_IDLEX	0	0	0	0	0.108692	0.136056	1.439744	32.29617	0.493397	0	0	13.81445	0
A	NOX_RUNEX	0.074022	0.179635	0.121322	0.220304	3.009851	2.229532	2.997992	4.620795	2.231729	8.860299	1.225529	6.41532	2.209824
A	NOX_STREX	0.128524	0.267877	0.23756	0.421943	0.918285	0.546224	13.69222	20.12701	2.22969	14.27718	0.325743	15.24156	0.99837
A	PM10_IDLEX	0	0	0	0	0.001176	0.00145	0.008251	0.063687	0.000296	0	0	0.018286	0
A	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.060977	0.13034	0.571741	0.01176	0.7448	0.13034
A	PM10_PMTW	0.008	0.008	0.008	0.008	0.010345	0.010862	0.012	0.035474	0.012	0.012	0.004	0.011038	0.012962
A	PM10_RUNEX	0.001788	0.002788	0.001572	0.001735	0.028396	0.024329	0.077004	0.030955	0.009734	0.142208	0.00188	0.036331	0.045558
A	PM10_STREX	0.002384	0.00426	0.002289	0.002662	0.001016	0.000404	0.000914	0.000167	0.000755	0.000802	0.00481	0.000767	0.001806
A	PM25_IDLEX	0	0	0	0	0.001125	0.001387	0.007894	0.060932	0.000283	0	0	0.017495	0
A	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.026133	0.05586	0.245032	0.00504	0.3192	0.05586
A	PM25_PMTW	0.002	0.002	0.002	0.002	0.002586	0.002715	0.003	0.008868	0.003	0.003	0.001	0.00276	0.00324
A	PM25_RUNEX	0.001651	0.002573	0.001446	0.001602	0.027123	0.023257	0.073669	0.029615	0.009291	0.136034	0.001772	0.034737	0.043521
A	PM25_STREX	0.002194	0.003927	0.002106	0.002455	0.000937	0.000372	0.000845	0.000156	0.000695	0.000739	0.004564	0.000705	0.001681
A	ROG_DIURN	0.049688	0.148239	0.061245	0.079254	0.002381	0.000964	0.001022	0.000107	0.001556	0.003182	1.150566	0.004703	1.167265
A	ROG_HTSK	0.138917	0.350866	0.160017	0.204858	0.087848	0.035165	0.045164	0.007851	0.021238	0.051605	0.911651	0.042114	0.087945
A	ROG_IDLEX	0	0	0	0	0.016362	0.014197	0.044007	1.156839	0.039382	0	0	0.722556	0
A	ROG_RESTL	0.03261	0.088316	0.042483	0.057106	0.000935	0.0004	0.000416	0.000053	0.000527	0.001404	0.567315	0.00127	0.310971
A	ROG_RUNEX	0.015694	0.042908	0.020521	0.044123	0.188607	0.147754	0.193416	0.154572	0.113382	0.686989	2.531468	0.162702	0.195344
A	ROG_RUNLS	0.047352	0.224204	0.086001	0.120734	0.27903	0.085368	0.016099	0.000557	0.061883	0.011115	0.842707	0.026843	0.023476
A	ROG_STREX	0.141938	0.371578	0.189513	0.379422	0.283395	0.132827	0.436491	0.165972	0.511286	0.793221	2.528063	0.533037	0.505623
A	SO2_IDLEX	0	0	0	0	0.000095	0.000146	0.001733	0.06331	0.000772	0	0	0.012259	0
A	SO2_RUNEX	0.002845	0.003413	0.003913	0.005222	0.006827	0.007168	0.011636	0.015731	0.013363	0.01742	0.002087	0.011089	0.012407
A	SO2_STREX	0.000685	0.00087	0.000947	0.001263	0.000321	0.000245	0.000586	0.000133	0.000877	0.001378	0.000742	0.000587	0.000769
A	TOG_DIURN	0.049688	0.148239	0.061245	0.079254	0.002381	0.000964	0.001022	0.000107	0.001556	0.003182	1.150566	0.004703	1.167265
A	TOG_HTSK	0.138917	0.350866	0.160017	0.204858	0.087848	0.035165	0.045164	0.007851	0.021238	0.051605	0.911651	0.042114	0.087945
A	TOG_IDLEX	0	0	0	0	0.022379	0.018832	0.055168	1.316973	0.054112	0	0	1.030554	0
A	TOG_RESTL	0.03261	0.088316	0.042483	0.057106	0.000935	0.0004	0.000416	0.000053	0.000527	0.001404	0.567315	0.00127	0.310971
A	TOG_RUNEX	0.022271	0.05974	0.029419	0.060879	0.22932	0.172999	0.223762	0.177665	0.148365	1.979123	3.022947	0.202536	0.254902
A	TOG_RUNLS	0.047352	0.224204	0.086001	0.120734	0.27903	0.085368	0.016099	0.000557	0.061883	0.011115	0.842707	0.026843	0.023476
A	TOG_STREX	0.155361	0.406578	0.207449	0.415183	0.310172	0.145425	0.47769	0.181565	0.559744	0.86834	2.748063	0.583608	0.552591
S	CH4_IDLEX	0	0	0	0	0.004947	0.003636	0.018292	0.984998	0.012679	0	0	0.86733	0
S	CH4_RUNEX	0.006587	0.016405	0.008916	0.016566	0.026219	0.012459	0.013206	0.009186	0.027848	1.222598	0.385073	0.027807	0.051284
S	CH4_STREX	0.008269	0.021408	0.011043	0.022137	0.019366	0.009116	0.075676	0.216321	0.036224	0.049445	0.145067	0.101091	0.033829
S	CO_IDLEX	0	0	0	0	0.137141	0.118851	0.340997	3.089606	0.271892	0	0	5.8225	0
S	CO_RUNEX	0.930609	2.093605	1.237052	2.05691	1.681611	0.921127	0.813433	0.818538	1.673903	6.902996	22.78223	1.640062	4.874038
S	CO_STREX	1.566161	3.942586	2.15287	3.716184	2.511052	1.229826	6.582028	2.703689	7.443092	8.226106	9.22361	7.514877	6.948201
S	CO2_NBIO_IDLEX	0	0	0	0	9.600959	15.01518	191.5293	7019.005	83.19522	0	0	1328.244	0
S	CO2_NBIO_RUNEX	312.036	371.1058	428.5424	570.1172	697.2087	738.0212	1215.415	1648.162	1359.721	2057.899	162.3392	1152.534	1246.193
S	CO2_NBIO_STREX	64.96549	77.89859	89.92937	117.8341	26.79041	21.97194	45.56479	7.995365	72.7295	118.0161	49.29541	38.5683	62.82726
S	NOX_IDLEX	0	0	0	0	0.108692	0.136056	1.486072	33.30275	0.509191	0	0	14.25708	0
S	NOX_RUNEX	0.065377	0.156093	0.106745	0.193643	2.828421	2.101978	2.806702	4.377038	2.078241	8.310364	1.023041	5.971335	2.020474
S	NOX_STREX	0.115822	0.241418	0.214341	0.381228	0.845591	0.50467	13.61101	20.09866	2.119208	14.16422	0.292755	15.17027	0.917108
S	PM10_IDLEX	0	0	0	0	0.001176	0.00145	0.006955	0.056861	0.00025	0	0	0.015415	0
S	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.060977	0.13034	0.571741	0.01176	0.7448	0.13034
S	PM10_PMTW	0.008	0.008	0.008	0.008	0.010345	0.010862	0.012	0.035474	0.012	0.012	0.004	0.011038	0.012962
S	PM10_RUNEX	0.001788	0.002788	0.001572	0.001735	0.028396	0.024329	0.077004	0.030955	0.009734	0.142208	0.00188	0.036331	0.045558
S	PM10_STREX	0.002384	0.00426	0.002289	0.002662	0.001016	0.000404	0.000914	0.000167	0.000755	0.000802	0.00481	0.000767	0.001806
S	PM25_IDLEX	0	0	0	0	0.001125	0.001387	0.006654	0.054402	0.000239	0	0	0.014749	0
S	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.026133	0.05586	0.245032	0.00504	0.3192	0.05586
S	PM25_PMTW	0.002	0.002	0.002	0.002	0.002586	0.002715	0.003	0.008868	0.003	0.003	0.001	0.00276	0.00324
S	PM25_RUNEX	0.001651	0.002573	0.001446	0.001602	0.027123	0.023257	0.073669	0.029615	0.009291	0.136034	0.001772	0.034737	0.043521
S	PM25_STREX	0.002194	0.003927	0.002106	0.002455	0.000937	0.000372	0.000845	0.000156	0.000695	0.000739	0.004564	0.000705	0.001681
S	ROG_DIURN	0.139279	0.420972	0.169781	0.21833	0.006546	0.002619	0.002866	0.000298	0.00409	0.008574	3.480341	0.012964	3.221047
S	ROG_HTSK	0.172083	0.454179	0.197184	0.246217	0.108303	0.043162	0.055587	0.00897	0.024193	0.06603	1.40446	0.048686	0.107881
S	ROG_IDLEX	0	0	0	0	0.016362	0.014197	0.041257	1.095667	0.038781	0	0	0.718283	0
S	ROG_RESTL	0.093766	0.258275	0.119546	0.157999	0.002701	0.001127	0.001258	0.000163	0.001414	0.004124	1.990351	0.003827	0.920336
S	ROG_RUNEX	0.017714	0.04675	0.023178	0.048337	0.19042	0.148351	0.193899	0.154794	0.115921	0.693095	2.363097	0.16505	0.196564
S	ROG_RUNLS	0.045983	0.214938	0.082404	0.116208	0.274221	0.08395	0.015956	0.000555	0.060514	0.010398	0.814888	0.023194	0.023133
S	ROG_STREX	0.111574	0.28903	0.148987	0.298853	0.261346	0.122944	0.40054	0.150963	0.468122	0.666994	1.982782	0.416922	0.457772
S	SO2_IDLEX	0	0	0	0	0.000095	0.000146	0.001835	0.066965	0.000807	0	0	0.012868	0
S	SO2_RUNEX	0.003129	0.003739	0.004298	0.005722	0.006828	0.007169	0.011636	0.015731	0.013364	0.01742	0.002061	0.01109	0.012408
S	SO2_STREX	0.000677	0.000849	0.000936	0.001244	0.000315	0.000243	0.000571	0.000127	0.000858	0.001329	0.000702	0.000517	0.000751
S	TOG_DIURN	0.139279	0.420972	0.169781	0.21833	0.006546	0.002619	0.002866	0.000298	0.00409	0.008574	3.480341	0.012964	3.221047
S	TOG_HTSK	0.172083	0.454179	0.197184	0.246217	0.108303	0.043162	0.055587	0.00897	0.024193	0.06603	1.40446	0.048686	0.107881
S	TOG_IDLEX	0	0	0	0	0.022379	0.018832	0.051676	1.247334	0.053428	0	0	1.025689	0

S	TOG_RESTL	0.093766	0.258275	0.119546	0.157999	0.002701	0.001127	0.001258	0.000163	0.001414	0.004124	1.990351	0.003827	0.920336
S	TOG_RUNEX	0.025247	0.065527	0.033333	0.067321	0.232121	0.173876	0.224484	0.178	0.152093	1.988648	2.828291	0.205962	0.258845
S	TOG_RUNLS	0.045983	0.214938	0.082404	0.116208	0.274221	0.08395	0.015956	0.000555	0.060514	0.010398	0.814888	0.023194	0.023133
S	TOG_STREX	0.122126	0.316266	0.163089	0.327025	0.286041	0.134606	0.438347	0.165148	0.512492	0.730177	2.155471	0.456478	0.500294
W	CH4_IDLEX	0	0	0	0	0.004947	0.003636	0.02107	1.115934	0.012748	0	0	0.868875	0
W	CH4_RUNEX	0.005526	0.014408	0.007495	0.014074	0.024676	0.012013	0.012834	0.009018	0.025994	1.217715	0.429353	0.026139	0.046957
W	CH4_STREX	0.012352	0.032592	0.016455	0.032979	0.022413	0.010471	0.08838	0.254835	0.042231	0.066465	0.224516	0.150465	0.040539
W	CO_IDLEX	0	0	0	0	0.137141	0.118851	0.647266	5.727183	0.301723	0	0	6.242383	0
W	CO_RUNEX	0.728907	1.754263	0.97555	1.683639	1.6314	0.901416	0.79521	0.807439	1.572728	6.846726	26.54158	1.544003	4.900847
W	CO_STREX	2.423266	6.176848	3.329884	5.652663	3.074856	1.494396	8.157012	3.360084	9.401576	13.5085	12.44049	15.15638	8.883768
W	CO2_NBIO_IDLEX	0	0	0	0	9.600959	15.01518	166.001	6106.923	74.46179	0	0	1176.292	0
W	CO2_NBIO_RUNEX	276.6923	330.7811	380.5054	507.8525	697.2087	738.0212	1215.415	1648.162	1359.721	2057.899	162.3392	1152.534	1246.193
W	CO2_NBIO_STREX	64.96549	77.89859	89.92937	117.8341	26.79041	21.97194	45.56479	7.995365	72.7295	118.0161	49.29541	38.5683	62.82726
W	NOX_IDLEX	0	0	0	0	0.108692	0.136056	1.37579	30.90613	0.471587	0	0	13.2032	0
W	NOX_RUNEX	0.081507	0.198628	0.133957	0.243069	3.068935	2.269226	3.053086	4.690616	2.290527	9.013789	1.331483	6.548083	2.286295
W	NOX_STREX	0.142513	0.296701	0.263299	0.467589	0.984199	0.585009	13.76418	20.14938	2.327107	14.37406	0.354546	15.29919	1.072387
W	PM10_IDLEX	0	0	0	0	0.001176	0.00145	0.010039	0.073112	0.00036	0	0	0.022251	0
W	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.060977	0.13034	0.571741	0.01176	0.7448	0.13034
W	PM10_PMTW	0.008	0.008	0.008	0.008	0.010345	0.010862	0.012	0.035474	0.012	0.012	0.004	0.011038	0.012962
W	PM10_RUNEX	0.001788	0.002788	0.001572	0.001735	0.028396	0.024329	0.077004	0.030955	0.009734	0.142208	0.00188	0.036331	0.045558
W	PM10_STREX	0.002384	0.00426	0.002289	0.002662	0.001016	0.000404	0.000914	0.000167	0.000755	0.000802	0.00481	0.000767	0.001806
W	PM25_IDLEX	0	0	0	0	0.001125	0.001387	0.009605	0.06995	0.000345	0	0	0.021288	0
W	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.026133	0.05586	0.245032	0.00504	0.3192	0.05586
W	PM25_PMTW	0.002	0.002	0.002	0.002	0.002586	0.002715	0.003	0.008868	0.003	0.003	0.001	0.00276	0.00324
W	PM25_RUNEX	0.001651	0.002573	0.001446	0.001602	0.027123	0.023257	0.073669	0.029615	0.009291	0.136034	0.001772	0.034737	0.043521
W	PM25_STREX	0.002194	0.003927	0.002106	0.002455	0.000937	0.000372	0.000845	0.000156	0.000695	0.000739	0.004564	0.000705	0.001681
W	ROG_DIURN	0.01106	0.030331	0.014169	0.019015	0.000518	0.000225	0.000207	0.000021	0.000408	0.000797	0.173127	0.001016	0.246122
W	ROG_HTSK	0.141029	0.364472	0.162335	0.207039	0.095407	0.037109	0.047114	0.008588	0.021443	0.054913	0.984165	0.044111	0.100613
W	ROG_IDLEX	0	0	0	0	0.016362	0.014197	0.047373	1.241314	0.040212	0	0	0.728457	0
W	ROG_RESTL	0.008017	0.020944	0.010602	0.014402	0.000277	0.000123	0.000112	0.000013	0.000196	0.000522	0.097996	0.000457	0.110727
W	ROG_RUNEX	0.015279	0.042888	0.019871	0.043701	0.187358	0.147273	0.193056	0.154421	0.111426	0.683276	2.707518	0.160921	0.195538
W	ROG_RUNLS	0.054684	0.272303	0.103612	0.144488	0.308359	0.094639	0.017955	0.000605	0.067604	0.01375	0.976334	0.034476	0.025168
W	ROG_STREX	0.166674	0.44008	0.222009	0.445249	0.302483	0.141219	0.467803	0.177858	0.545748	0.896629	3.069339	0.62055	0.54863
W	SO2_IDLEX	0	0	0	0	0.000095	0.000146	0.001594	0.058263	0.000723	0	0	0.011418	0
W	SO2_RUNEX	0.002773	0.003331	0.003814	0.005094	0.006827	0.007168	0.011636	0.015731	0.013362	0.017419	0.002132	0.011088	0.012408
W	SO2_STREX	0.000692	0.000889	0.000957	0.00128	0.000326	0.000247	0.000598	0.000138	0.000892	0.00142	0.000788	0.000643	0.000785
W	TOG_DIURN	0.01106	0.030331	0.014169	0.019015	0.000518	0.000225	0.000207	0.000021	0.000408	0.000797	0.173127	0.001016	0.246122
W	TOG_HTSK	0.141029	0.364472	0.162335	0.207039	0.095407	0.037109	0.047114	0.008588	0.021443	0.054913	0.984165	0.044111	0.100613
W	TOG_IDLEX	0	0	0	0	0.022379	0.018832	0.059361	1.413142	0.055057	0	0	1.037271	0
W	TOG_RESTL	0.008017	0.020944	0.010602	0.014402	0.000277	0.000123	0.000112	0.000013	0.000196	0.000522	0.097996	0.000457	0.110727
W	TOG_RUNEX	0.02161	0.059419	0.028415	0.059883	0.22732	0.172292	0.223219	0.177436	0.145493	1.973324	3.227628	0.199937	0.253091
W	TOG_RUNLS	0.054684	0.272303	0.103612	0.144488	0.308359	0.094639	0.017955	0.000605	0.067604	0.01375	0.976334	0.034476	0.025168
W	TOG_STREX	0.182433	0.481518	0.243018	0.487203	0.331057	0.154614	0.511946	0.19456	0.597471	0.981535	3.336292	0.679424	0.599563

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: PLACER
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAI	ROG_RUNLOSS	ROG_RESTLOS	ROG_DIURN	TOG_RUNEX
PLACER	2020	T6 CAIRP heavy	Aggregated	Aggregated	DSL	19.672326	3865.109624	287.2159595	0.042423049	0.068221142	0	0	0	0	0	0.048295412
PLACER	2020	T6 CAIRP small	Aggregated	Aggregated	DSL	11.7624673	630.2906873	171.7320225	0.064711575	0.075396868	0	0	0	0	0	0.073669202
PLACER	2020	T6 instate construction	Aggregated	Aggregated	DSL	149.2358734	10146.27228	674.6895813	0.487292288	0.079408193	0	0	0	0	0	0.554745177
PLACER	2020	T6 instate construction	Aggregated	Aggregated	DSL	364.7921291	18622.57649	1649.211032	0.469177321	0.117251623	0	0	0	0	0	0.534122665
PLACER	2020	T6 instate heavy	Aggregated	Aggregated	DSL	421.5056547	63479.64015	4864.116816	0.125884917	0.084574664	0	0	0	0	0	0.143310395
PLACER	2020	T6 instate small	Aggregated	Aggregated	DSL	1778.982334	96627.78235	20529.20949	0.174330356	0.098307182	0	0	0	0	0	0.19846184
PLACER	2020	T6 OOS heavy	Aggregated	Aggregated	DSL	11.40392876	2253.597582	166.4973598	0.040038318	0.067191283	0	0	0	0	0	0.045580577
PLACER	2020	T6 OOS small	Aggregated	Aggregated	DSL	5.902717728	305.9511755	86.17967882	0.07989892	0.081336371	0	0	0	0	0	0.090958838
PLACER	2020	T6 Public	Aggregated	Aggregated	DSL	356.6059154	5585.914443	1081.704609	0.082301015	0.373793645	0	0	0	0	0	0.093693441
PLACER	2020	T6 utility	Aggregated	Aggregated	DSL	33.76889098	563.5837716	388.3422463	0.026015099	0.140781767	0	0	0	0	0	0.02961621
PLACER	2020	T7 Ag	Aggregated	Aggregated	DSL	2.08	16.08689468	9.152	2.028272681	3.430040178	0	0	0	0	0	2.309034053
PLACER	2020	T7 CAIRP	Aggregated	Aggregated	DSL	649.5947975	117603.1335	9484.084044	0.071957994	10.69502839	0	0	0	0	0	0.081918699
PLACER	2020	T7 CAIRP construction	Aggregated	Aggregated	DSL	39.62517776	7288.155514	179.143888	0.163320704	1.589538111	0	0	0	0	0	0.185928189
PLACER	2020	T7 NNOOS	Aggregated	Aggregated	DSL	710.4456232	143398.3922	10372.5061	0.074713845	13.6069176	0	0	0	0	0	0.085056025
PLACER	2020	T7 NOOS	Aggregated	Aggregated	DSL	255.2587214	46189.95112	3726.777332	0.067864734	13.25548727	0	0	0	0	0	0.077258834
PLACER	2020	T7 other port	Aggregated	Aggregated	DSL	2.444743622	388.9158154	18.58005153	0.250430368	1.642470989	0	0	0	0	0	0.285095911
PLACER	2020	T7 POAK	Aggregated	Aggregated	DSL	65.17101454	7281.173757	495.2997105	0.299641015	2.622505323	0	0	0	0	0	0.341118486
PLACER	2020	T7 Public	Aggregated	Aggregated	DSL	327.1198549	6625.446407	992.2635589	0.142847605	1.089638356	0	0	0	0	0	0.162621124
PLACER	2020	T7 Single	Aggregated	Aggregated	DSL	281.0441025	20210.12592	3243.209978	0.265938588	2.102446975	0	0	0	0	0	0.302750839
PLACER	2020	T7 single construction	Aggregated	Aggregated	DSL	256.3589638	18080.57332	1158.988908	0.527049061	1.571257355	0	0	0	0	0	0.600005237
PLACER	2020	T7 SWCV	Aggregated	Aggregated	DSL	154.9688568	6319.545108	604.3785415	0.038741555	1.298686012	0	0	0	0	0	0.044104312
PLACER	2020	T7 tractor	Aggregated	Aggregated	DSL	336.3769369	43018.32023	4271.987099	0.183130228	1.765021018	0	0	0	0	0	0.208479825
PLACER	2020	T7 tractor construction	Aggregated	Aggregated	DSL	212.2347191	14914.88116	959.5049136	0.550075814	1.584838589	0	0	0	0	0	0.626219442
PLACER	2020	T7 utility	Aggregated	Aggregated	DSL	13.70388992	278.1194075	157.5947341	0.078199644	0.591224611	0	0	0	0	0	0.089024342

TOG_IDLEX	TOG_STREX	TOG_HOTSOAI	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX
0.077664577	0	0	0	0	0	0.173226198	1.997497121	0	1.535288828	4.344722835	1.066920743	943.2582048	639.8808577	0	0.001970441	0.003168695
0.085833595	0	0	0	0	0	0.246343435	2.057581626	0	1.680610041	4.57600315	1.051847583	981.9733595	637.2142249	0	0.003005685	0.003501989
0.090400183	0	0	0	0	0	1.021616423	1.885276222	0	5.571586373	5.476007634	1.7980492	1274.991818	667.7913158	0	0.022633465	0.003688305
0.133482047	0	0	0	0	0	1.033345149	2.148843556	0	4.434956995	6.806140081	1.527915915	1264.833926	672.6338209	0	0.021792071	0.005446034
0.096281818	0	0	0	0	0	0.382462654	2.020690847	0	2.53901492	5.251717218	1.554219881	1003.00603	641.2304245	0	0.005847028	0.003928274
0.111915243	0	0	0	0	0	0.513470217	2.114878593	0	2.758812926	5.774276096	1.457544169	1061.465428	652.1910034	0	0.008097194	0.004566114
0.076492161	0	0	0	0	0	0.169977291	2.009725156	0	1.46889516	4.235046856	1.082885389	942.0841774	638.5824022	0	0.001859676	0.003120861
0.092595267	0	0	0	0	0	0.295530758	2.058729967	0	1.907418478	4.941435965	0.998458675	992.7867337	645.5329327	0	0.003711098	0.003777864
0.425535612	0	0	0	0	0	0.222043626	6.649897196	0	5.454164723	36.57871419	1.397790998	1196.058559	3464.338096	0	0.003822669	0.017361747
0.160269325	0	0	0	0	0	0.118557252	4.86637068	0	1.824099495	11.90556912	1.555143729	1070.813095	1783.066943	0	0.001208334	0.006538948
3.904839644	0	0	0	0	0	6.772429812	12.84870922	0	22.1548998	26.0582699	0	1716.365504	1680.803915	0	0.094208013	0.159316482
12.17547571	0	0	0	0	0	0.331084035	134.7154686	0	3.237634029	131.86477	1.848943908	1404.591106	26028.13277	0	0.003342262	0.496756369
1.809568141	0	0	0	0	0	0.745643585	21.22970118	0	4.983044742	21.16930689	3.886788243	1778.155704	4011.583274	0	0.007585824	0.073829928
15.49043991	0	0	0	0	0	0.352876875	168.7585658	0	2.768933999	152.9372272	1.890466004	1353.809322	30323.98106	0	0.003470265	0.63200608
15.09036323	0	0	0	0	0	0.320475844	167.8741949	0	3.191970538	164.1353357	1.858405965	1404.838664	32472.9941	0	0.003152141	0.615683052
1.869828194	0	0	0	0	0	0.89597672	17.1039243	0	6.058462279	28.60111315	1.035967182	1862.925333	4730.34392	0	0.011631842	0.076288523
2.985522681	0	0	0	0	0	1.010165457	27.30954326	0	6.653785612	45.66690796	1.035967182	1904.910768	7552.986584	0	0.013917549	0.12180858
1.240470323	0	0	0	0	0	0.471015559	9.101127723	0	11.25172133	37.6907716	1.977840573	1833.470421	3353.444784	0	0.006634901	0.050610879
2.39347584	0	0	0	0	0	0.852035352	26.73723881	0	5.47713451	30.21641274	2.738157532	1588.353802	5235.119855	0	0.012352159	0.097653217
1.788756892	0	0	0	0	0	1.2975974	19.31049448	0	7.59616976	23.26477742	3.313673264	1892.045773	3866.101195	0	0.024480064	0.072980835
1.478455167	0	0	0	0	0	0.101901975	14.05334221	0	6.689657647	39.07995687	2.936501455	3952.273239	4166.081332	0	0.001799445	0.060320602
2.009342074	0	0	0	0	0	0.666266635	19.47703474	0	5.545960928	28.11225307	1.093670551	1437.954383	4328.014329	0	0.008505925	0.081980655
1.804218093	0	0	0	0	0	1.460365182	19.49614351	0	7.594524501	23.28172897	3.375487701	1897.639274	4078.094288	0	0.025549597	0.073611648
0.673064215	0	0	0	0	0	0.311135521	6.853245734	0	4.759763145	13.6687438	2.118340302	1725.903176	1790.184897	0	0.003632171	0.027460852

CH4_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW	SOx_RUNEX	SOx_IDLEX	SOx_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX
0	0.033167414	0.009400086	0	0.012000003	0.130340037	0.031732606	0.008993443	0	0.003000001	0.055860016	0.008911436	0.006045277	0	0.148267054	0.10058036	0
0	0.049042264	0.012250202	0	0.012000003	0.130340037	0.046920717	0.011720264	0	0.003000001	0.055860016	0.009277197	0.006020084	0	0.154352537	0.100161202	0
0	0.145769807	0.014380054	0	0.012000003	0.130340037	0.13946387	0.01375798	0	0.003000001	0.055860016	0.01204549	0.006308961	0	0.200410959	0.104967495	0
0	0.143000805	0.031261286	0	0.012000003	0.130340037	0.136814654	0.029908936	0	0.003000001	0.055860016	0.011949524	0.006354711	0	0.198814279	0.10572867	0
0	0.05410316	0.016995252	0	0.012000003	0.130340037	0.051762681	0.016260045	0	0.003000001	0.055860016	0.009475904	0.006058027	0	0.15765858	0.100792493	0
0	0.076938524	0.022615239	0	0.012000003	0.130340037	0.073610197	0.021636914	0	0.003000001	0.055860016	0.010028199	0.006161577	0	0.166847583	0.102515343	0
0	0.032713589	0.00884943	0	0.012000003	0.130340037	0.031298414	0.008466608	0	0.003000001	0.055860016	0.008900344	0.00603301	0	0.148082513	0.100376261	0
0	0.059897435	0.01492241	0	0.012000003	0.130340037	0.057306298	0.014276873	0	0.003000001	0.055860016	0.009379357	0.006098675	0	0.156052249	0.101468787	0
0	0.033375689	0.071324012	0	0.012000003	0.130340037	0.031931871	0.068238567	0	0.003000001	0.055860016	0.011299768	0.032729349	0	0.188003749	0.544545705	0
0	0.008142534	0.005218657	0	0.012000003	0.130340037	0.007790292	0.0049929	0	0.003000001	0.055860016	0.010116511	0.016845532	0	0.168316907	0.280273293	0
0	1.143334613	0.547955354	0	0.03600001	0.061740018	1.093874464	0.524251048	0	0.009000003	0.026460008	0.01621537	0.015879402	0	0.269788755	0.264198969	0
0	0.050417027	0.24529842	0	0.03600001	0.061740018	0.048236009	0.234686919	0	0.009000003	0.026460008	0.01326988	0.245900892	0	0.220782162	4.091260008	0
0	0.045655522	0.017240497	0	0.03600001	0.061740018	0.043680484	0.016494681	0	0.009000003	0.026460008	0.016799133	0.03789945	0	0.279501314	0.630565026	0
0	0.055479918	0.475080349	0	0.03600001	0.061740018	0.053079881	0.454528583	0	0.009000003	0.026460008	0.012790119	0.286485937	0	0.212799973	4.766507537	0
0	0.04925478	0.284519608	0	0.03600001	0.061740018	0.04712404	0.272211415	0	0.009000003	0.026460008	0.013272219	0.306788747	0	0.220821074	5.104302459	0
0	0.034132822	0.009601146	0	0.03600001	0.061740018	0.032656251	0.009185805	0	0.009000003	0.026460008	0.017599995	0.044689944	0	0.29282592	0.74354419	0
0	0.038662632	0.015329986	0	0.03600001	0.061740018	0.036990103	0.014666817	0	0.009000003	0.026460008	0.017996652	0.071356872	0	0.299425445	1.18722431	0
0	0.061736852	0.089201316	0	0.03600001	0.061740018	0.059066143	0.085342507	0	0.009000003	0.026460008	0.017321719	0.031681684	0	0.288196018	0.527114821	0
0	0.104052409	0.040094723	0	0.03600001	0.061740018	0.099551148	0.038360243	0	0.009000003	0.026460008	0.015005979	0.049458817	0	0.249667099	0.822887938	0
0	0.141891411	0.039487867	0	0.03600001	0.061740018	0.135753252	0.03777964	0	0.009000003	0.026460008	0.01787511	0.036525007	0	0.297403247	0.607697269	0
0	0.015438061	0.051235754	0	0.03600001	0.061740018	0.014770218	0.049019318	0	0.009000003	0.026460008	0.037339118	0.039359071	0	0.621242314	0.654849969	0
0	0.105715852	0.054877302	0	0.03600001	0.061740018	0.101142631	0.052503334	0	0.009000003	0.026460008	0.01358508	0.040888933	0	0.226026404	0.680303581	0
0	0.128766567	0.027509301	0	0.03600001	0.061740018	0.123196182	0.026319261	0	0.009000003	0.026460008	0.017927955	0.038527813	0	0.298282468	0.641019631	0
0	0.018529708	0.009544771	0	0.03600001	0.061740018	0.017728121	0.009131869	0	0.009000003	0.026460008	0.016305477	0.016912779	0	0.271287945	0.281392136	0

Idling Emissions Factors

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: PLACER
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW

Region	Calendar Y	Vehicle Ca	Model Yea	Speed	Fuel	VMT	% of Population		ROG_RUNI	TOG_RUNI	CO_RUNEX	NOx_RUNI	SOx_RUNE	CO2_RUNE	CH4_RUNE	PM10_RUI	PM2_5_RU	N2O_RUNEX
PLACER	2020	LDA	Aggregate	10	GAS	5418.835	48%		0.061474	0.089534	1.489872	0.093088	0.005374	543.0389	0.0149	0.007036	0.00647	0.009174
PLACER	2020	LDT1	Aggregate	10	GAS	797.0605	6%		0.113971	0.166093	2.515087	0.200174	0.006216	628.1636	0.025544	0.009082	0.008351	0.014775
PLACER	2020	LDT2	Aggregate	10	GAS	2992.409	22%		0.076289	0.111265	1.787247	0.164622	0.006867	693.9072	0.018496	0.006619	0.006086	0.01287
PLACER	2020	LHD1	Aggregate	10	GAS	12805.75	2%		0.164049	0.236804	2.378178	0.43626	0.015601	1576.561	0.032975	0.005645	0.005193	0.025504
PLACER	2020	LHD2	Aggregate	10	GAS	1672.158	0%		0.088664	0.129378	1.192787	0.331904	0.017803	1799.025	0.019722	0.004341	0.003991	0.021799
PLACER	2020	MDV	Aggregate	10	GAS	1994.791	17%		0.125308	0.176045	2.636041	0.224599	0.008428	851.7146	0.026915	0.006983	0.006425	0.016459
							100%	Weighted Average:	0.079071	0.114049	1.783746	0.14271	0.006328	639.4491	0.018298	0.006779	0.006234	0.011644
								grams/hour	0.790709	1.140492	17.83746	1.427103	0.063279	6394.491	0.182982	0.067792	0.062342	0.116435

*Green cels indicate calculations made using data from EMFAC. Non-highlighted cells are direct outpus from EMFAC2017.
Weighted average is calculated based on the percent of population attributable to each vehicle type. Percent of population is obtained from the EMFAC2017 data for aggregate speeds (see 'EMFAC2017-vehicle population)

EMFAC2017 - vehicle population

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: PLACER
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

						miles/day		
Region	Calendar Y	Vehicle Ca	Model Yea	Speed	Fuel	Population	VMT	Trips	% of Population
PLACER	2020	LDA	Aggregate	Aggregate	GAS	123597.5	4664456.208	581628.8	48%
PLACER	2020	LDT1	Aggregate	Aggregate	GAS	16642.32	626084.2598	76034.21	6%
PLACER	2020	LDT2	Aggregate	Aggregate	GAS	57708.41	2240153.802	268117.3	22%
PLACER	2020	LHD1	Aggregate	Aggregate	GAS	5042.422	173047.8336	75124.57	2%
PLACER	2020	LHD2	Aggregate	Aggregate	GAS	627.6128	22596.3604	9350.496	0%
PLACER	2020	MCY	Aggregate	Aggregate	GAS	9232.642	64721.26897	18465.28	4%
PLACER	2020	MDV	Aggregate	Aggregate	GAS	44340.27	1503712.637	203185.2	17%
						257191.2			100%

*Green cels indicate calculations made using data from EMFAC2017.

EMFAC Particulate Matter Idling Calcs

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: PLACER
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW

														g/hour (columns 'O' * 'E')		g/hour (columns 'O' * 'E')	
													g/miles				
Region	Calendar Y	Vehicle Ca	Model Yea	Speed	Fuel	VMT	ROG_RUN	TOG_RUNI	CO_RUNEX	NOx_RUNE	SOx_RUNE	CO2_RUNE	CH4_RUNE	PM10_RUI	PM10_idling	PM2_5_RU	PM10_idling	N2O_RUNEX
PLACER	2020	LHD1	Aggregate	5	GAS	4910.97	0.249842	0.360844	3.039348	0.495001	0.019222	1942.481	0.05062	0.008889	0.044446418	0.008176	0.040882285	0.029078
PLACER	2020	LHD2	Aggregate	5	GAS	641.2681	0.137246	0.200269	1.472198	0.380151	0.021932	2216.273	0.03072	0.006871	0.034355715	0.006318	0.031588812	0.025028

TRU Emission Factors

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: County
Region: Placer
Calendar Year: 2018
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

Region	CalYr	VehClass	MdlYr	HP_Bin	Fuel	Total_Activ	Total_Popu	Horsepower_H	HC_tpd	ROG_tpd	TOG_tpd	CO_tpd	NOx_tpd	CO2_tpd	PM10_tpd	PM2_5_tpd	PM_tpd	SOx_tpd	NH3_tpd	Fuel_gpy
Placer	2018	TRU - Instate Truck TRU	Aggregate	25	Diesel	109772.9	80.65606	1547797.865	0.000941	0.001138	0.001355	0.009106	0.011044	0.218052	0.000471442	0.000433727	0.000471442	2.0013E-06	1.79165E-06	138.411294

Emission Rates									
g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/hp-hr	g/gallon	g/gallon
ROG Exh	NOX Exh	CO Exhau	PM10 Exhaus	PM2.5 Exhau	CO2 Exhaust	SOX Exhaust	CH4*	N2O*
0.24	2.36	1.95	0.10	0.09	46.65	0.00	0.57	0.26

*Source for CH4 and N2O emission factors for TRU is: https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf (Table 5)

grams per ton: 907185
Fuel use (gallons/hr): 0.001261

CalEEMod Output Files

Loomis Costco - Recirculated DEIR

Placer-Sacramento County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	2.29	Acre	2.29	99,752.40	0
Parking Lot	778.00	Space	7.00	311,200.00	0
Discount Club	155.00	1000sqft	10.21	155,000.00	0
Gasoline/Service Station	30.00	Pump	0.10	4,235.25	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land use based on project description and overal site disturbance. Other Asphalt Surfaces for Condition of Approval roadway project and Transportation mitigation roadway improvements applicable to Alternative Option A.

Construction Phase - Construction phases and duration based on project-specific construction schedule.

Off-road Equipment - Construction equipment based on project-specific equipment list.

Trips and VMT - Worker trips based on CalEEMod defaults.
Vendor trips based on project-specific projections.
Balanced site.

Grading -

Vehicle Trips - Operational trip rates adjusted to reflect daily new VMT to roadways per Traffic Impact Analysis.

Area Coating -

Construction Off-road Equipment Mitigation - Watering of disturbed areas on site for dust suppression mitigation.

Architectural Coating -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Parking	24657	24655
tblConstructionPhase	NumDays	300.00	20.00
tblConstructionPhase	NumDays	30.00	50.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	10.00
tblLandUse	LotAcreage	3.56	10.21
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	114.00
tblTripsAndVMT	VendorTripNumber	0.00	124.00
tblTripsAndVMT	VendorTripNumber	0.00	56.00
tblTripsAndVMT	VendorTripNumber	0.00	60.00
tblTripsAndVMT	VendorTripNumber	93.00	20.00
tblTripsAndVMT	WorkerTripNumber	38.00	28.00
tblVehicleTrips	CC_TL	7.30	16.00
tblVehicleTrips	CC_TTP	64.30	80.10
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	7.80
tblVehicleTrips	CW_TTP	16.70	19.90
tblVehicleTrips	DV_TP	40.00	31.50
tblVehicleTrips	PB_TP	15.00	33.30
tblVehicleTrips	PR_TP	45.00	35.20
tblVehicleTrips	ST_TR	53.75	15.70
tblVehicleTrips	ST_TR	168.56	0.00
tblVehicleTrips	SU_TR	33.67	15.70
tblVehicleTrips	SU_TR	168.56	0.00
tblVehicleTrips	WD_TR	41.80	15.20
tblVehicleTrips	WD_TR	168.56	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	80.0118	76.1019	47.7399	0.1154	9.9406	2.9812	12.9219	3.9084	2.7835	6.6919	0.0000	11,407.4889	11,407.4889	2.3785	0.0000	11,466.9519
Maximum	**80.0118**	**76.1019**	**47.7399**	**0.1154**	**9.9406**	**2.9812**	**12.9219**	**3.9084**	**2.7835**	**6.6919**	**0.0000**	**11,407.4889**	**11,407.4889**	**2.3785**	**0.0000**	**11,466.9519**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	80.0118	76.1019	47.7399	0.1154	5.0245	2.9812	8.0057	1.9146	2.7835	4.6981	0.0000	11,407.4889	11,407.4889	2.3785	0.0000	11,466.9519
Maximum	**80.0118**	**76.1019**	**47.7399**	**0.1154**	**5.0245**	**2.9812**	**8.0057**	**1.9146**	**2.7835**	**4.6981**	**0.0000**	**11,407.4889**	**11,407.4889**	**2.3785**	**0.0000**	**11,466.9519**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**49.46**	**0.00**	**38.05**	**51.01**	**0.00**	**29.79**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Energy	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990
Mobile	4.2009	29.7588	49.1444	0.1568	11.7646	0.1784	11.9430	3.1527	0.1683	3.3211		15,885.7792	15,885.7792	0.7552		15,904.6580
Total	**8.2551**	**30.2680**	**49.6706**	**0.1599**	**11.7646**	**0.2174**	**11.9820**	**3.1527**	**0.2073**	**3.3601**		**16,495.9647**	**16,495.9647**	**0.7674**	**0.0112**	**16,518.4824**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Energy	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990
Mobile	4.2009	29.7588	49.1444	0.1568	11.7646	0.1784	11.9430	3.1527	0.1683	3.3211		15,885.7792	15,885.7792	0.7552		15,904.6580
Total	**8.2551**	**30.2680**	**49.6706**	**0.1599**	**11.7646**	**0.2174**	**11.9820**	**3.1527**	**0.2073**	**3.3601**		**16,495.9647**	**16,495.9647**	**0.7674**	**0.0112**	**16,518.4824**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Rough Grade	Grading	1/15/2020	3/24/2020	5	50	Prep for construction, including removal of old slap and abandoned utilities, grading, and base for paving
2	Base for Paving	Paving	3/25/2020	3/31/2020	5	5	
3	Paving - Asphalt	Paving	4/1/2020	4/7/2020	5	5	Asphalt
4	Concrete Foundations/Slab on Grade	Paving	4/8/2020	4/21/2020	5	10	Delivery and pour of concrete foundations/slab
5	Metal Building Erection	Building Construction	4/22/2020	5/19/2020	5	20	Erection of pre-fabricated metal building
6	Architectural Coating	Architectural Coating	5/20/2020	6/16/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 9.29

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 238,853; Non-Residential Outdoor: 79,618; Striped Parking Area: 24,657 (Architectural Coating – sqft)

OffRoad Equipment

Loomis Costco - Recirculated DEIR - Placer-Sacramento County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Rough Grade	Crushing/Proc. Equipment	2	8.00	85	0.78
Rough Grade	Excavators	1	8.00	158	0.38
Rough Grade	Graders	1	8.00	187	0.41
Rough Grade	Rubber Tired Dozers	1	8.00	247	0.40
Rough Grade	Scrapers	6	3.00	367	0.48
Rough Grade	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Base for Paving	Rollers	3	8.00	80	0.38
Base for Paving	Rubber Tired Loaders	2	8.00	203	0.36
Paving - Asphalt	Paving Equipment	1	8.00	132	0.36
Paving - Asphalt	Rollers	3	8.00	80	0.38
Paving - Asphalt	Rubber Tired Loaders	1	8.00	203	0.36
Concrete Foundations/Slab on Grade	Off-Highway Tractors	4	8.00	124	0.44
Concrete Foundations/Slab on Grade	Other Construction Equipment	1	8.00	172	0.42
Metal Building Erection	Aerial Lifts	13	8.00	63	0.31
Metal Building Erection	Excavators	2	8.00	158	0.38
Metal Building Erection	Forklifts	5	8.00	89	0.20
Metal Building Erection	Off-Highway Tractors	4	8.00	124	0.44
Metal Building Erection	Rough Terrain Forklifts	1	8.00	100	0.40
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Rough Grade	15	28.00	114.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Base for Paving	5	13.00	124.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving - Asphalt	5	13.00	56.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Concrete Foundations/Slab on	5	13.00	60.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Metal Building Erection	25	224.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	45.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Rough Grade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.9385	0.0000	8.9385	3.6251	0.0000	3.6251			0.0000			0.0000
Off-Road	5.9785	62.5315	43.8190	0.0809		2.9196	2.9196		2.7246	2.7246		7,803.0979	7,803.0979	2.1921		7,857.8993
Total	**5.9785**	**62.5315**	**43.8190**	**0.0809**	**8.9385**	**2.9196**	**11.8581**	**3.6251**	**2.7246**	**6.3497**		**7,803.0979**	**7,803.0979**	**2.1921**		**7,857.8993**

3.2 Rough Grade - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4343	13.4954	2.9493	0.0325	0.7722	0.0602	0.8323	0.2223	0.0575	0.2798		3,400.3201	3,400.3201	0.1814		3,404.8537
Worker	0.1052	0.0749	0.7360	2.0500e-003	0.2300	1.4600e-003	0.2315	0.0610	1.3500e-003	0.0624		204.0709	204.0709	5.1200e-003		204.1989
Total	**0.5395**	**13.5703**	**3.6854**	**0.0346**	**1.0022**	**0.0616**	**1.0638**	**0.2833**	**0.0589**	**0.3422**		**3,604.3910**	**3,604.3910**	**0.1865**		**3,609.0526**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0223	0.0000	4.0223	1.6313	0.0000	1.6313			0.0000			0.0000
Off-Road	5.9785	62.5315	43.8190	0.0809		2.9196	2.9196		2.7246	2.7246	0.0000	7,803.0979	7,803.0979	2.1921		7,857.8993
Total	**5.9785**	**62.5315**	**43.8190**	**0.0809**	**4.0223**	**2.9196**	**6.9419**	**1.6313**	**2.7246**	**4.3559**	**0.0000**	**7,803.0979**	**7,803.0979**	**2.1921**		**7,857.8993**

3.2 Rough Grade - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4343	13.4954	2.9493	0.0325	0.7722	0.0602	0.8323	0.2223	0.0575	0.2798		3,400.3201	3,400.3201	0.1814		3,404.8537
Worker	0.1052	0.0749	0.7360	2.0500e-003	0.2300	1.4600e-003	0.2315	0.0610	1.3500e-003	0.0624		204.0709	204.0709	5.1200e-003		204.1989
Total	**0.5395**	**13.5703**	**3.6854**	**0.0346**	**1.0022**	**0.0616**	**1.0638**	**0.2833**	**0.0589**	**0.3422**		**3,604.3910**	**3,604.3910**	**0.1865**		**3,609.0526**

3.3 Base for Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3726	15.0626	8.9510	0.0204		0.6908	0.6908		0.6355	0.6355		1,972.5192	1,972.5192	0.6380		1,988.4680
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.2406**	**15.0626**	**8.9510**	**0.0204**		**0.6908**	**0.6908**		**0.6355**	**0.6355**		**1,972.5192**	**1,972.5192**	**0.6380**		**1,988.4680**

3.3 Base for Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4724	14.6792	3.2080	0.0354	0.8399	0.0654	0.9053	0.2418	0.0626	0.3044		3,698.5937	3,698.5937	0.1973		3,703.5251
Worker	0.0488	0.0348	0.3417	9.5000e-004	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		94.7472	94.7472	2.3800e-003		94.8066
Total	**0.5213**	**14.7140**	**3.5498**	**0.0363**	**0.9467**	**0.0661**	**1.0128**	**0.2701**	**0.0632**	**0.3333**		**3,793.3410**	**3,793.3410**	**0.1996**		**3,798.3317**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3726	15.0626	8.9510	0.0204		0.6908	0.6908		0.6355	0.6355	0.0000	1,972.5192	1,972.5192	0.6380		1,988.4680
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.2406**	**15.0626**	**8.9510**	**0.0204**		**0.6908**	**0.6908**		**0.6355**	**0.6355**	**0.0000**	**1,972.5192**	**1,972.5192**	**0.6380**		**1,988.4680**

3.3 Base for Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4724	14.6792	3.2080	0.0354	0.8399	0.0654	0.9053	0.2418	0.0626	0.3044		3,698.5937	3,698.5937	0.1973		3,703.5251
Worker	0.0488	0.0348	0.3417	9.5000e-004	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		94.7472	94.7472	2.3800e-003		94.8066
Total	**0.5213**	**14.7140**	**3.5498**	**0.0363**	**0.9467**	**0.0661**	**1.0128**	**0.2701**	**0.0632**	**0.3333**		**3,793.3410**	**3,793.3410**	**0.1996**		**3,798.3317**

3.4 Paving - Asphalt - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2060	12.7943	9.8500	0.0182		0.6515	0.6515		0.5994	0.5994		1,761.8874	1,761.8874	0.5698		1,776.1332
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.0739**	**12.7943**	**9.8500**	**0.0182**		**0.6515**	**0.6515**		**0.5994**	**0.5994**		**1,761.8874**	**1,761.8874**	**0.5698**		**1,776.1332**

3.4 Paving - Asphalt - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2134	6.6293	1.4488	0.0160	0.3793	0.0296	0.4089	0.1092	0.0283	0.1375		1,670.3327	1,670.3327	0.0891		1,672.5597
Worker	0.0488	0.0348	0.3417	9.5000e-004	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		94.7472	94.7472	2.3800e-003		94.8066
Total	**0.2622**	**6.6641**	**1.7905**	**0.0169**	**0.4861**	**0.0302**	**0.5163**	**0.1375**	**0.0289**	**0.1664**		**1,765.0799**	**1,765.0799**	**0.0915**		**1,767.3663**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2060	12.7943	9.8500	0.0182		0.6515	0.6515		0.5994	0.5994	0.0000	1,761.8874	1,761.8874	0.5698		1,776.1332
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.0739**	**12.7943**	**9.8500**	**0.0182**		**0.6515**	**0.6515**		**0.5994**	**0.5994**	**0.0000**	**1,761.8874**	**1,761.8874**	**0.5698**		**1,776.1332**

3.4 Paving - Asphalt - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2134	6.6293	1.4488	0.0160	0.3793	0.0296	0.4089	0.1092	0.0283	0.1375		1,670.3327	1,670.3327	0.0891		1,672.5597
Worker	0.0488	0.0348	0.3417	9.5000e-004	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		94.7472	94.7472	2.3800e-003		94.8066
Total	**0.2622**	**6.6641**	**1.7905**	**0.0169**	**0.4861**	**0.0302**	**0.5163**	**0.1375**	**0.0289**	**0.1664**		**1,765.0799**	**1,765.0799**	**0.0915**		**1,767.3663**

3.5 Concrete Foundations/Slab on Grade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5371	16.3642	16.4973	0.0250		0.8162	0.8162		0.7509	0.7509		2,419.1062	2,419.1062	0.7824		2,438.6659
Paving	2.4340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.9711**	**16.3642**	**16.4973**	**0.0250**		**0.8162**	**0.8162**		**0.7509**	**0.7509**		**2,419.1062**	**2,419.1062**	**0.7824**		**2,438.6659**

3.5 Concrete Foundations/Slab on Grade - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2286	7.1029	1.5523	0.0171	0.4064	0.0317	0.4381	0.1170	0.0303	0.1473		1,789.6421	1,789.6421	0.0955		1,792.0283
Worker	0.0488	0.0348	0.3417	9.5000e-004	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		94.7472	94.7472	2.3800e-003		94.8066
Total	**0.2774**	**7.1376**	**1.8940**	**0.0181**	**0.5132**	**0.0323**	**0.5455**	**0.1453**	**0.0309**	**0.1762**		**1,884.3894**	**1,884.3894**	**0.0978**		**1,886.8349**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5371	16.3642	16.4973	0.0250		0.8162	0.8162		0.7509	0.7509	0.0000	2,419.1062	2,419.1062	0.7824		2,438.6659
Paving	2.4340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.9711**	**16.3642**	**16.4973**	**0.0250**		**0.8162**	**0.8162**		**0.7509**	**0.7509**	**0.0000**	**2,419.1062**	**2,419.1062**	**0.7824**		**2,438.6659**

3.5 Concrete Foundations/Slab on Grade - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2286	7.1029	1.5523	0.0171	0.4064	0.0317	0.4381	0.1170	0.0303	0.1473		1,789.6421	1,789.6421	0.0955		1,792.0283
Worker	0.0488	0.0348	0.3417	9.5000e-004	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		94.7472	94.7472	2.3800e-003		94.8066
Total	**0.2774**	**7.1376**	**1.8940**	**0.0181**	**0.5132**	**0.0323**	**0.5455**	**0.1453**	**0.0309**	**0.1762**		**1,884.3894**	**1,884.3894**	**0.0978**		**1,886.8349**

3.6 Metal Building Erection - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9013	32.5351	41.3343	0.0621		1.5153	1.5153		1.3941	1.3941		6,008.4317	6,008.4317	1.9433		6,057.0129
Total	**2.9013**	**32.5351**	**41.3343**	**0.0621**		**1.5153**	**1.5153**		**1.3941**	**1.3941**		**6,008.4317**	**6,008.4317**	**1.9433**		**6,057.0129**

3.6 Metal Building Erection - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0762	2.3676	0.5174	5.7000e-003	0.1355	0.0106	0.1460	0.0390	0.0101	0.0491		596.5474	596.5474	0.0318		597.3428
Worker	0.8413	0.5993	5.8882	0.0164	1.8401	0.0117	1.8518	0.4881	0.0108	0.4989		1,632.5675	1,632.5675	0.0409		1,633.5908
Total	**0.9175**	**2.9669**	**6.4056**	**0.0221**	**1.9756**	**0.0222**	**1.9978**	**0.5271**	**0.0209**	**0.5480**		**2,229.1148**	**2,229.1148**	**0.0728**		**2,230.9336**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9013	32.5351	41.3343	0.0621		1.5153	1.5153		1.3941	1.3941	0.0000	6,008.4317	6,008.4317	1.9433		6,057.0129
Total	**2.9013**	**32.5351**	**41.3343**	**0.0621**		**1.5153**	**1.5153**		**1.3941**	**1.3941**	**0.0000**	**6,008.4317**	**6,008.4317**	**1.9433**		**6,057.0129**

3.6 Metal Building Erection - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0762	2.3676	0.5174	5.7000e-003	0.1355	0.0106	0.1460	0.0390	0.0101	0.0491		596.5474	596.5474	0.0318		597.3428
Worker	0.8413	0.5993	5.8882	0.0164	1.8401	0.0117	1.8518	0.4881	0.0108	0.4989		1,632.5675	1,632.5675	0.0409		1,633.5908
Total	**0.9175**	**2.9669**	**6.4056**	**0.0221**	**1.9756**	**0.0222**	**1.9978**	**0.5271**	**0.0209**	**0.5480**		**2,229.1148**	**2,229.1148**	**0.0728**		**2,230.9336**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	79.5199					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479		375.2641	375.2641	0.0291		375.9904
Total	**79.8428**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**		**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1690	0.1204	1.1829	3.2900e-003	0.3697	2.3500e-003	0.3720	0.0981	2.1600e-003	0.1002		327.9711	327.9711	8.2200e-003		328.1767
Total	**0.1690**	**0.1204**	**1.1829**	**3.2900e-003**	**0.3697**	**2.3500e-003**	**0.3720**	**0.0981**	**2.1600e-003**	**0.1002**		**327.9711**	**327.9711**	**8.2200e-003**		**328.1767**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	79.5199					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479	0.0000	375.2641	375.2641	0.0291		375.9904
Total	**79.8428**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**	**0.0000**	**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1690	0.1204	1.1829	3.2900e-003	0.3697	2.3500e-003	0.3720	0.0981	2.1600e-003	0.1002		327.9711	327.9711	8.2200e-003		328.1767
Total	**0.1690**	**0.1204**	**1.1829**	**3.2900e-003**	**0.3697**	**2.3500e-003**	**0.3720**	**0.0981**	**2.1600e-003**	**0.1002**		**327.9711**	**327.9711**	**8.2200e-003**		**328.1767**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.2009	29.7588	49.1444	0.1568	11.7646	0.1784	11.9430	3.1527	0.1683	3.3211		15,885.7792	15,885.7792	0.7552		15,904.6580
Unmitigated	4.2009	29.7588	49.1444	0.1568	11.7646	0.1784	11.9430	3.1527	0.1683	3.3211		15,885.7792	15,885.7792	0.7552		15,904.6580

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Discount Club	2,356.00	2,433.50	2433.50	5,386,385	5,386,385
Gasoline/Service Station	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	2,356.00	2,433.50	2,433.50	5,386,385	5,386,385

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Discount Club	7.80	16.00	0.00	19.90	80.10	0.00	35.2	31.5	33.3
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Discount Club	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Gasoline/Service Station	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Other Asphalt Surfaces	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Parking Lot	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990
NaturalGas Unmitigated	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Discount Club	4968.49	0.0536	0.4871	0.4092	2.9200e-003		0.0370	0.0370		0.0370	0.0370		584.5286	584.5286	0.0112	0.0107	588.0022
Gasoline/Service Station	216.288	2.3300e-003	0.0212	0.0178	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003		25.4456	25.4456	4.9000e-004	4.7000e-004	25.5968
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0559**	**0.5083**	**0.4270**	**3.0500e-003**		**0.0386**	**0.0386**		**0.0386**	**0.0386**		**609.9742**	**609.9742**	**0.0117**	**0.0112**	**613.5990**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Discount Club	4.96849	0.0536	0.4871	0.4092	2.9200e-003		0.0370	0.0370		0.0370	0.0370		584.5286	584.5286	0.0112	0.0107	588.0022
Gasoline/Service Station	0.216288	2.3300e-003	0.0212	0.0178	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003		25.4456	25.4456	4.9000e-004	4.7000e-004	25.5968
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0559**	**0.5083**	**0.4270**	**3.0500e-003**		**0.0386**	**0.0386**		**0.0386**	**0.0386**		**609.9742**	**609.9742**	**0.0117**	**0.0112**	**613.5990**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Unmitigated	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4357					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.3300e-003	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Total	**3.9982**	**9.2000e-004**	**0.0992**	**1.0000e-005**		**3.6000e-004**	**3.6000e-004**		**3.6000e-004**	**3.6000e-004**		**0.2113**	**0.2113**	**5.7000e-004**		**0.2254**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4357					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.3300e-003	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Total	**3.9982**	**9.2000e-004**	**0.0992**	**1.0000e-005**		**3.6000e-004**	**3.6000e-004**		**3.6000e-004**	**3.6000e-004**		**0.2113**	**0.2113**	**5.7000e-004**		**0.2254**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Loomis Costco - Recirculated DEIR

Placer-Sacramento County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	2.29	Acre	2.29	99,752.40	0
Parking Lot	778.00	Space	7.00	311,200.00	0
Discount Club	155.00	1000sqft	10.21	155,000.00	0
Gasoline/Service Station	30.00	Pump	0.10	4,235.25	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land use based on project description and overal site disturbance. Other Asphalt Surfaces for Condition of Approval roadway project and Transportation mitigation roadway improvements applicable to Alternative Option A.

Construction Phase - Construction phases and duration based on project-specific construction schedule.

Off-road Equipment - Construction equipment based on project-specific equipment list.

Trips and VMT - Worker trips based on CalEEMod defaults.
Vendor trips based on project-specific projections.
Balanced site.

Grading -

Vehicle Trips - Operational trip rates adjusted to reflect daily new VMT to roadways per Traffic Impact Analysis.

Area Coating -

Construction Off-road Equipment Mitigation - Watering of disturbed areas on site for dust suppression mitigation.

Architectural Coating -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Parking	24657	24655
tblConstructionPhase	NumDays	300.00	20.00
tblConstructionPhase	NumDays	30.00	50.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	10.00
tblLandUse	LotAcreage	3.56	10.21
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	114.00
tblTripsAndVMT	VendorTripNumber	0.00	124.00
tblTripsAndVMT	VendorTripNumber	0.00	56.00
tblTripsAndVMT	VendorTripNumber	0.00	60.00
tblTripsAndVMT	VendorTripNumber	93.00	20.00
tblTripsAndVMT	WorkerTripNumber	38.00	28.00
tblVehicleTrips	CC_TL	7.30	16.00
tblVehicleTrips	CC_TTP	64.30	80.10
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	7.80
tblVehicleTrips	CW_TTP	16.70	19.90
tblVehicleTrips	DV_TP	40.00	31.50
tblVehicleTrips	PB_TP	15.00	33.30
tblVehicleTrips	PR_TP	45.00	35.20
tblVehicleTrips	ST_TR	53.75	15.70
tblVehicleTrips	ST_TR	168.56	0.00
tblVehicleTrips	SU_TR	33.67	15.70
tblVehicleTrips	SU_TR	168.56	0.00
tblVehicleTrips	WD_TR	41.80	15.20
tblVehicleTrips	WD_TR	168.56	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	80.0176	75.9484	48.3342	0.1168	9.9406	2.9796	12.9203	3.9084	2.7820	6.6904	0.0000	11,550.6447	11,550.6447	2.3581	0.0000	11,609.5961
Maximum	**80.0176**	**75.9484**	**48.3342**	**0.1168**	**9.9406**	**2.9796**	**12.9203**	**3.9084**	**2.7820**	**6.6904**	**0.0000**	**11,550.6447**	**11,550.6447**	**2.3581**	**0.0000**	**11,609.5961**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	80.0176	75.9484	48.3342	0.1168	5.0245	2.9796	8.0041	1.9146	2.7820	4.6966	0.0000	11,550.6447	11,550.6447	2.3581	0.0000	11,609.5961
Maximum	**80.0176**	**75.9484**	**48.3342**	**0.1168**	**5.0245**	**2.9796**	**8.0041**	**1.9146**	**2.7820**	**4.6966**	**0.0000**	**11,550.6447**	**11,550.6447**	**2.3581**	**0.0000**	**11,609.5961**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**49.46**	**0.00**	**38.05**	**51.01**	**0.00**	**29.80**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Energy	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990
Mobile	5.2126	28.6146	49.3592	0.1708	11.7646	0.1754	11.9400	3.1527	0.1655	3.3182		17,298.6012	17,298.6012	0.7195		17,316.5896
Total	**9.2667**	**29.1238**	**49.8853**	**0.1739**	**11.7646**	**0.2144**	**11.9790**	**3.1527**	**0.2045**	**3.3572**		**17,908.7867**	**17,908.7867**	**0.7318**	**0.0112**	**17,930.4140**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Energy	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990
Mobile	5.2126	28.6146	49.3592	0.1708	11.7646	0.1754	11.9400	3.1527	0.1655	3.3182		17,298.6012	17,298.6012	0.7195		17,316.5896
Total	**9.2667**	**29.1238**	**49.8853**	**0.1739**	**11.7646**	**0.2144**	**11.9790**	**3.1527**	**0.2045**	**3.3572**		**17,908.7867**	**17,908.7867**	**0.7318**	**0.0112**	**17,930.4140**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Rough Grade	Grading	1/15/2020	3/24/2020	5	50	Prep for construction, including removal of old slap and abandoned utilities, grading, and base for paving
2	Base for Paving	Paving	3/25/2020	3/31/2020	5	5	
3	Paving - Asphalt	Paving	4/1/2020	4/7/2020	5	5	Asphalt
4	Concrete Foundations/Slab on Grade	Paving	4/8/2020	4/21/2020	5	10	Delivery and pour of concrete foundations/slab
5	Metal Building Erection	Building Construction	4/22/2020	5/19/2020	5	20	Erection of pre-fabricated metal building
6	Architectural Coating	Architectural Coating	5/20/2020	6/16/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 9.29

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 238,853; Non-Residential Outdoor: 79,618; Striped Parking Area: 24,657 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Rough Grade	Crushing/Proc. Equipment	2	8.00	85	0.78
Rough Grade	Excavators	1	8.00	158	0.38
Rough Grade	Graders	1	8.00	187	0.41
Rough Grade	Rubber Tired Dozers	1	8.00	247	0.40
Rough Grade	Scrapers	6	3.00	367	0.48
Rough Grade	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Base for Paving	Rollers	3	8.00	80	0.38
Base for Paving	Rubber Tired Loaders	2	8.00	203	0.36
Paving - Asphalt	Paving Equipment	1	8.00	132	0.36
Paving - Asphalt	Rollers	3	8.00	80	0.38
Paving - Asphalt	Rubber Tired Loaders	1	8.00	203	0.36
Concrete Foundations/Slab on Grade	Off-Highway Tractors	4	8.00	124	0.44
Concrete Foundations/Slab on Grade	Other Construction Equipment	1	8.00	172	0.42
Metal Building Erection	Aerial Lifts	13	8.00	63	0.31
Metal Building Erection	Excavators	2	8.00	158	0.38
Metal Building Erection	Forklifts	5	8.00	89	0.20
Metal Building Erection	Off-Highway Tractors	4	8.00	124	0.44
Metal Building Erection	Rough Terrain Forklifts	1	8.00	100	0.40
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Rough Grade	15	28.00	114.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Base for Paving	5	13.00	124.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving - Asphalt	5	13.00	56.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Concrete Foundations/Slab on	5	13.00	60.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Metal Building Erection	25	224.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	45.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Rough Grade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.9385	0.0000	8.9385	3.6251	0.0000	3.6251			0.0000			0.0000
Off-Road	5.9785	62.5315	43.8190	0.0809		2.9196	2.9196		2.7246	2.7246		7,803.0979	7,803.0979	2.1921		7,857.8993
Total	**5.9785**	**62.5315**	**43.8190**	**0.0809**	**8.9385**	**2.9196**	**11.8581**	**3.6251**	**2.7246**	**6.3497**		**7,803.0979**	**7,803.0979**	**2.1921**		**7,857.8993**

3.2 Rough Grade - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4098	13.3571	2.4326	0.0336	0.7722	0.0585	0.8307	0.2223	0.0560	0.2783		3,518.3214	3,518.3214	0.1604		3,522.3305
Worker	0.1087	0.0598	0.8216	2.3000e-003	0.2300	1.4600e-003	0.2315	0.0610	1.3500e-003	0.0624		229.2255	229.2255	5.6300e-003		229.3662
Total	**0.5186**	**13.4169**	**3.2543**	**0.0359**	**1.0022**	**0.0600**	**1.0622**	**0.2833**	**0.0574**	**0.3407**		**3,747.5469**	**3,747.5469**	**0.1660**		**3,751.6968**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0223	0.0000	4.0223	1.6313	0.0000	1.6313			0.0000			0.0000
Off-Road	5.9785	62.5315	43.8190	0.0809		2.9196	2.9196		2.7246	2.7246	0.0000	7,803.0979	7,803.0979	2.1921		7,857.8993
Total	**5.9785**	**62.5315**	**43.8190**	**0.0809**	**4.0223**	**2.9196**	**6.9419**	**1.6313**	**2.7246**	**4.3559**	**0.0000**	**7,803.0979**	**7,803.0979**	**2.1921**		**7,857.8993**

3.2 Rough Grade - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4098	13.3571	2.4326	0.0336	0.7722	0.0585	0.8307	0.2223	0.0560	0.2783		3,518.3214	3,518.3214	0.1604		3,522.3305
Worker	0.1087	0.0598	0.8216	2.3000e-003	0.2300	1.4600e-003	0.2315	0.0610	1.3500e-003	0.0624		229.2255	229.2255	5.6300e-003		229.3662
Total	**0.5186**	**13.4169**	**3.2543**	**0.0359**	**1.0022**	**0.0600**	**1.0622**	**0.2833**	**0.0574**	**0.3407**		**3,747.5469**	**3,747.5469**	**0.1660**		**3,751.6968**

3.3 Base for Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3726	15.0626	8.9510	0.0204		0.6908	0.6908		0.6355	0.6355		1,972.5192	1,972.5192	0.6380		1,988.4680
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.2406**	**15.0626**	**8.9510**	**0.0204**		**0.6908**	**0.6908**		**0.6355**	**0.6355**		**1,972.5192**	**1,972.5192**	**0.6380**		**1,988.4680**

3.3 Base for Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4458	14.5287	2.6460	0.0366	0.8399	0.0637	0.9036	0.2418	0.0609	0.3027		3,826.9461	3,826.9461	0.1744		3,831.3069
Worker	0.0505	0.0278	0.3815	1.0700e-003	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		106.4261	106.4261	2.6100e-003		106.4915
Total	**0.4963**	**14.5565**	**3.0275**	**0.0376**	**0.9467**	**0.0644**	**1.0110**	**0.2701**	**0.0615**	**0.3317**		**3,933.3722**	**3,933.3722**	**0.1770**		**3,937.7984**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3726	15.0626	8.9510	0.0204		0.6908	0.6908		0.6355	0.6355	0.0000	1,972.5192	1,972.5192	0.6380		1,988.4680
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.2406**	**15.0626**	**8.9510**	**0.0204**		**0.6908**	**0.6908**		**0.6355**	**0.6355**	**0.0000**	**1,972.5192**	**1,972.5192**	**0.6380**		**1,988.4680**

3.3 Base for Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4458	14.5287	2.6460	0.0366	0.8399	0.0637	0.9036	0.2418	0.0609	0.3027		3,826.9461	3,826.9461	0.1744		3,831.3069
Worker	0.0505	0.0278	0.3815	1.0700e-003	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		106.4261	106.4261	2.6100e-003		106.4915
Total	**0.4963**	**14.5565**	**3.0275**	**0.0376**	**0.9467**	**0.0644**	**1.0110**	**0.2701**	**0.0615**	**0.3317**		**3,933.3722**	**3,933.3722**	**0.1770**		**3,937.7984**

3.4 Paving - Asphalt - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2060	12.7943	9.8500	0.0182		0.6515	0.6515		0.5994	0.5994		1,761.8874	1,761.8874	0.5698		1,776.1332
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.0739**	**12.7943**	**9.8500**	**0.0182**		**0.6515**	**0.6515**		**0.5994**	**0.5994**		**1,761.8874**	**1,761.8874**	**0.5698**		**1,776.1332**

3.4 Paving - Asphalt - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2013	6.5614	1.1950	0.0165	0.3793	0.0288	0.4081	0.1092	0.0275	0.1367		1,728.2982	1,728.2982	0.0788		1,730.2676
Worker	0.0505	0.0278	0.3815	1.0700e-003	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		106.4261	106.4261	2.6100e-003		106.4915
Total	**0.2518**	**6.5891**	**1.5765**	**0.0176**	**0.4861**	**0.0294**	**0.5155**	**0.1375**	**0.0281**	**0.1657**		**1,834.7244**	**1,834.7244**	**0.0814**		**1,836.7591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2060	12.7943	9.8500	0.0182		0.6515	0.6515		0.5994	0.5994	0.0000	1,761.8874	1,761.8874	0.5698		1,776.1332
Paving	4.8680					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.0739**	**12.7943**	**9.8500**	**0.0182**		**0.6515**	**0.6515**		**0.5994**	**0.5994**	**0.0000**	**1,761.8874**	**1,761.8874**	**0.5698**		**1,776.1332**

3.4 Paving - Asphalt - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2013	6.5614	1.1950	0.0165	0.3793	0.0288	0.4081	0.1092	0.0275	0.1367		1,728.2982	1,728.2982	0.0788		1,730.2676
Worker	0.0505	0.0278	0.3815	1.0700e-003	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		106.4261	106.4261	2.6100e-003		106.4915
Total	**0.2518**	**6.5891**	**1.5765**	**0.0176**	**0.4861**	**0.0294**	**0.5155**	**0.1375**	**0.0281**	**0.1657**		**1,834.7244**	**1,834.7244**	**0.0814**		**1,836.7591**

3.5 Concrete Foundations/Slab on Grade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5371	16.3642	16.4973	0.0250		0.8162	0.8162		0.7509	0.7509		2,419.1062	2,419.1062	0.7824		2,438.6659
Paving	2.4340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.9711**	**16.3642**	**16.4973**	**0.0250**		**0.8162**	**0.8162**		**0.7509**	**0.7509**		**2,419.1062**	**2,419.1062**	**0.7824**		**2,438.6659**

3.5 Concrete Foundations/Slab on Grade - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2157	7.0300	1.2803	0.0177	0.4064	0.0308	0.4372	0.1170	0.0295	0.1465		1,851.7481	1,851.7481	0.0844		1,853.8582
Worker	0.0505	0.0278	0.3815	1.0700e-003	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		106.4261	106.4261	2.6100e-003		106.4915
Total	**0.2662**	**7.0578**	**1.6618**	**0.0188**	**0.5132**	**0.0315**	**0.5447**	**0.1453**	**0.0301**	**0.1754**		**1,958.1742**	**1,958.1742**	**0.0870**		**1,960.3496**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5371	16.3642	16.4973	0.0250		0.8162	0.8162		0.7509	0.7509	0.0000	2,419.1062	2,419.1062	0.7824		2,438.6659
Paving	2.4340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.9711**	**16.3642**	**16.4973**	**0.0250**		**0.8162**	**0.8162**		**0.7509**	**0.7509**	**0.0000**	**2,419.1062**	**2,419.1062**	**0.7824**		**2,438.6659**

3.5 Concrete Foundations/Slab on Grade - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2157	7.0300	1.2803	0.0177	0.4064	0.0308	0.4372	0.1170	0.0295	0.1465		1,851.7481	1,851.7481	0.0844		1,853.8582
Worker	0.0505	0.0278	0.3815	1.0700e-003	0.1068	6.8000e-004	0.1075	0.0283	6.3000e-004	0.0290		106.4261	106.4261	2.6100e-003		106.4915
Total	**0.2662**	**7.0578**	**1.6618**	**0.0188**	**0.5132**	**0.0315**	**0.5447**	**0.1453**	**0.0301**	**0.1754**		**1,958.1742**	**1,958.1742**	**0.0870**		**1,960.3496**

3.6 Metal Building Erection - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9013	32.5351	41.3343	0.0621		1.5153	1.5153		1.3941	1.3941		6,008.4317	6,008.4317	1.9433		6,057.0129
Total	**2.9013**	**32.5351**	**41.3343**	**0.0621**		**1.5153**	**1.5153**		**1.3941**	**1.3941**		**6,008.4317**	**6,008.4317**	**1.9433**		**6,057.0129**

3.6 Metal Building Erection - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0719	2.3434	0.4268	5.9000e-003	0.1355	0.0103	0.1457	0.0390	9.8200e-003	0.0488		617.2494	617.2494	0.0281		617.9527
Worker	0.8699	0.4783	6.5731	0.0184	1.8401	0.0117	1.8518	0.4881	0.0108	0.4989		1,833.8038	1,833.8038	0.0450		1,834.9298
Total	**0.9418**	**2.8216**	**6.9999**	**0.0243**	**1.9756**	**0.0220**	**1.9975**	**0.5271**	**0.0206**	**0.5477**		**2,451.0532**	**2,451.0532**	**0.0732**		**2,452.8825**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9013	32.5351	41.3343	0.0621		1.5153	1.5153		1.3941	1.3941	0.0000	6,008.4317	6,008.4317	1.9433		6,057.0129
Total	**2.9013**	**32.5351**	**41.3343**	**0.0621**		**1.5153**	**1.5153**		**1.3941**	**1.3941**	**0.0000**	**6,008.4317**	**6,008.4317**	**1.9433**		**6,057.0129**

3.6 Metal Building Erection - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0719	2.3434	0.4268	5.9000e-003	0.1355	0.0103	0.1457	0.0390	9.8200e-003	0.0488		617.2494	617.2494	0.0281		617.9527
Worker	0.8699	0.4783	6.5731	0.0184	1.8401	0.0117	1.8518	0.4881	0.0108	0.4989		1,833.8038	1,833.8038	0.0450		1,834.9298
Total	**0.9418**	**2.8216**	**6.9999**	**0.0243**	**1.9756**	**0.0220**	**1.9975**	**0.5271**	**0.0206**	**0.5477**		**2,451.0532**	**2,451.0532**	**0.0732**		**2,452.8825**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	79.5199					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479		375.2641	375.2641	0.0291		375.9904
Total	**79.8428**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**		**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1748	0.0961	1.3205	3.7000e-003	0.3697	2.3500e-003	0.3720	0.0981	2.1600e-003	0.1002		368.3981	368.3981	9.0500e-003		368.6243
Total	**0.1748**	**0.0961**	**1.3205**	**3.7000e-003**	**0.3697**	**2.3500e-003**	**0.3720**	**0.0981**	**2.1600e-003**	**0.1002**		**368.3981**	**368.3981**	**9.0500e-003**		**368.6243**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	79.5199					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479	0.0000	375.2641	375.2641	0.0291		375.9904
Total	**79.8428**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**	**0.0000**	**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1748	0.0961	1.3205	3.7000e-003	0.3697	2.3500e-003	0.3720	0.0981	2.1600e-003	0.1002		368.3981	368.3981	9.0500e-003		368.6243
Total	**0.1748**	**0.0961**	**1.3205**	**3.7000e-003**	**0.3697**	**2.3500e-003**	**0.3720**	**0.0981**	**2.1600e-003**	**0.1002**		**368.3981**	**368.3981**	**9.0500e-003**		**368.6243**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.2126	28.6146	49.3592	0.1708	11.7646	0.1754	11.9400	3.1527	0.1655	3.3182		17,298.6012	17,298.6012	0.7195		17,316.5896
Unmitigated	5.2126	28.6146	49.3592	0.1708	11.7646	0.1754	11.9400	3.1527	0.1655	3.3182		17,298.6012	17,298.6012	0.7195		17,316.5896

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Discount Club	2,356.00	2,433.50	2433.50	5,386,385	5,386,385
Gasoline/Service Station	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	2,356.00	2,433.50	2,433.50	5,386,385	5,386,385

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Discount Club	7.80	16.00	0.00	19.90	80.10	0.00	35.2	31.5	33.3
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Discount Club	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Gasoline/Service Station	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Other Asphalt Surfaces	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Parking Lot	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990
NaturalGas Unmitigated	0.0559	0.5083	0.4270	3.0500e-003		0.0386	0.0386		0.0386	0.0386		609.9742	609.9742	0.0117	0.0112	613.5990

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Discount Club	4968.49	0.0536	0.4871	0.4092	2.9200e-003		0.0370	0.0370		0.0370	0.0370		584.5286	584.5286	0.0112	0.0107	588.0022
Gasoline/Service Station	216.288	2.3300e-003	0.0212	0.0178	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003		25.4456	25.4456	4.9000e-004	4.7000e-004	25.5968
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0559**	**0.5083**	**0.4270**	**3.0500e-003**		**0.0386**	**0.0386**		**0.0386**	**0.0386**		**609.9742**	**609.9742**	**0.0117**	**0.0112**	**613.5990**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Discount Club	4.96849	0.0536	0.4871	0.4092	2.9200e-003		0.0370	0.0370		0.0370	0.0370		584.5286	584.5286	0.0112	0.0107	588.0022
Gasoline/Service Station	0.216288	2.3300e-003	0.0212	0.0178	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003		25.4456	25.4456	4.9000e-004	4.7000e-004	25.5968
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0559**	**0.5083**	**0.4270**	**3.0500e-003**		**0.0386**	**0.0386**		**0.0386**	**0.0386**		**609.9742**	**609.9742**	**0.0117**	**0.0112**	**613.5990**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Unmitigated	3.9983	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4357					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.3300e-003	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Total	**3.9982**	**9.2000e-004**	**0.0992**	**1.0000e-005**		**3.6000e-004**	**3.6000e-004**		**3.6000e-004**	**3.6000e-004**		**0.2113**	**0.2113**	**5.7000e-004**		**0.2254**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4357					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.5532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.3300e-003	9.2000e-004	0.0992	1.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004		0.2113	0.2113	5.7000e-004		0.2254
Total	**3.9982**	**9.2000e-004**	**0.0992**	**1.0000e-005**		**3.6000e-004**	**3.6000e-004**		**3.6000e-004**	**3.6000e-004**		**0.2113**	**0.2113**	**5.7000e-004**		**0.2254**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Loomis Costco - Recirculated DEIR

Placer-Sacramento County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	2.29	Acre	2.29	99,752.40	0
Parking Lot	778.00	Space	7.00	311,200.00	0
Discount Club	155.00	1000sqft	10.21	155,000.00	0
Gasoline/Service Station	30.00	Pump	0.10	4,235.25	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land use based on project description and overal site disturbance. Other Asphalt Surfaces for Condition of Approval roadway project and Transportation mitigation roadway improvements applicable to Alternative Option A.

Construction Phase - Construction phases and duration based on project-specific construction schedule.

Off-road Equipment - Construction equipment based on project-specific equipment list.

Trips and VMT - Worker trips based on CalEEMod defaults.
Vendor trips based on project-specific projections.
Balanced site.

Grading -

Vehicle Trips - Operational trip rates adjusted to reflect daily new VMT to roadways per Traffic Impact Analysis.

Area Coating -

Construction Off-road Equipment Mitigation - Watering of disturbed areas on site for dust suppression mitigation.

Architectural Coating -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Parking	24657	24655
tblConstructionPhase	NumDays	300.00	20.00
tblConstructionPhase	NumDays	30.00	50.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	10.00
tblLandUse	LotAcreage	3.56	10.21
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblTripsAndVMT	VendorTripNumber	0.00	114.00
tblTripsAndVMT	VendorTripNumber	0.00	124.00
tblTripsAndVMT	VendorTripNumber	0.00	56.00
tblTripsAndVMT	VendorTripNumber	0.00	60.00
tblTripsAndVMT	VendorTripNumber	93.00	20.00
tblTripsAndVMT	WorkerTripNumber	38.00	28.00
tblVehicleTrips	CC_TL	7.30	16.00
tblVehicleTrips	CC_TTP	64.30	80.10
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	7.80
tblVehicleTrips	CW_TTP	16.70	19.90
tblVehicleTrips	DV_TP	40.00	31.50
tblVehicleTrips	PB_TP	15.00	33.30
tblVehicleTrips	PR_TP	45.00	35.20
tblVehicleTrips	ST_TR	53.75	15.70
tblVehicleTrips	ST_TR	168.56	0.00
tblVehicleTrips	SU_TR	33.67	15.70
tblVehicleTrips	SU_TR	168.56	0.00
tblVehicleTrips	WD_TR	41.80	15.20
tblVehicleTrips	WD_TR	168.56	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	1.0537	2.5231	1.8433	4.2700e-003	0.2759	0.0992	0.3751	0.1052	0.0924	0.1976	0.0000	383.0769	383.0769	0.0796	0.0000	385.0674
Maximum	**1.0537**	**2.5231**	**1.8433**	**4.2700e-003**	**0.2759**	**0.0992**	**0.3751**	**0.1052**	**0.0924**	**0.1976**	**0.0000**	**383.0769**	**383.0769**	**0.0796**	**0.0000**	**385.0674**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	1.0537	2.5231	1.8433	4.2700e-003	0.1530	0.0992	0.2522	0.0553	0.0924	0.1478	0.0000	383.0766	383.0766	0.0796	0.0000	385.0671
Maximum	**1.0537**	**2.5231**	**1.8433**	**4.2700e-003**	**0.1530**	**0.0992**	**0.2522**	**0.0553**	**0.0924**	**0.1478**	**0.0000**	**383.0766**	**383.0766**	**0.0796**	**0.0000**	**385.0671**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**44.54**	**0.00**	**32.76**	**47.40**	**0.00**	**25.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-15-2020**	**4-14-2020**	2.2903	2.2903
2	**4-15-2020**	**7-14-2020**	1.2847	1.2847
		Highest	2.2903	2.2903

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7288	8.0000e-005	8.9300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0173	0.0173	5.0000e-005	0.0000	0.0184
Energy	0.0102	0.0928	0.0779	5.6000e-004		7.0500e-003	7.0500e-003		7.0500e-003	7.0500e-003	0.0000	674.7114	674.7114	0.0279	7.2200e-003	677.5596
Mobile	0.7685	5.2375	8.3209	0.0285	2.0022	0.0314	2.0336	0.5386	0.0296	0.5682	0.0000	2,620.3947	2,620.3947	0.1170	0.0000	2,623.3204
Waste						0.0000	0.0000		0.0000	0.0000	138.5982	0.0000	138.5982	8.1909	0.0000	343.3711
Water						0.0000	0.0000		0.0000	0.0000	3.7689	26.1136	29.8825	0.3883	9.3800e-003	42.3862
Total	**1.5075**	**5.3304**	**8.4077**	**0.0291**	**2.0022**	**0.0385**	**2.0407**	**0.5386**	**0.0367**	**0.5753**	**142.3671**	**3,321.2370**	**3,463.6040**	**8.7242**	**0.0166**	**3,686.6556**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7288	8.0000e-005	8.9300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0173	0.0173	5.0000e-005	0.0000	0.0184
Energy	0.0102	0.0928	0.0779	5.6000e-004		7.0500e-003	7.0500e-003		7.0500e-003	7.0500e-003	0.0000	674.7114	674.7114	0.0279	7.2200e-003	677.5596
Mobile	0.7685	5.2375	8.3209	0.0285	2.0022	0.0314	2.0336	0.5386	0.0296	0.5682	0.0000	2,620.3947	2,620.3947	0.1170	0.0000	2,623.3204
Waste						0.0000	0.0000		0.0000	0.0000	138.5982	0.0000	138.5982	8.1909	0.0000	343.3711
Water						0.0000	0.0000		0.0000	0.0000	3.7689	26.1136	29.8825	0.3883	9.3800e-003	42.3862
Total	**1.5075**	**5.3304**	**8.4077**	**0.0291**	**2.0022**	**0.0385**	**2.0407**	**0.5386**	**0.0367**	**0.5753**	**142.3671**	**3,321.2370**	**3,463.6040**	**8.7242**	**0.0166**	**3,686.6556**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Rough Grade	Grading	1/15/2020	3/24/2020	5	50	Prep for construction, including removal of old slap and abandoned utilities, grading, and base for paving
2	Base for Paving	Paving	3/25/2020	3/31/2020	5	5	
3	Paving - Asphalt	Paving	4/1/2020	4/7/2020	5	5	Asphalt
4	Concrete Foundations/Slab on Grade	Paving	4/8/2020	4/21/2020	5	10	Delivery and pour of concrete foundations/slab
5	Metal Building Erection	Building Construction	4/22/2020	5/19/2020	5	20	Erection of pre-fabricated metal building
6	Architectural Coating	Architectural Coating	5/20/2020	6/16/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 9.29

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 238,853; Non-Residential Outdoor: 79,618; Striped Parking Area: 24,657 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Rough Grade	Crushing/Proc. Equipment	2	8.00	85	0.78
Rough Grade	Excavators	1	8.00	158	0.38
Rough Grade	Graders	1	8.00	187	0.41
Rough Grade	Rubber Tired Dozers	1	8.00	247	0.40
Rough Grade	Scrapers	6	3.00	367	0.48
Rough Grade	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Base for Paving	Rollers	3	8.00	80	0.38
Base for Paving	Rubber Tired Loaders	2	8.00	203	0.36
Paving - Asphalt	Paving Equipment	1	8.00	132	0.36
Paving - Asphalt	Rollers	3	8.00	80	0.38
Paving - Asphalt	Rubber Tired Loaders	1	8.00	203	0.36
Concrete Foundations/Slab on Grade	Off-Highway Tractors	4	8.00	124	0.44
Concrete Foundations/Slab on Grade	Other Construction Equipment	1	8.00	172	0.42
Metal Building Erection	Aerial Lifts	13	8.00	63	0.31
Metal Building Erection	Excavators	2	8.00	158	0.38
Metal Building Erection	Forklifts	5	8.00	89	0.20
Metal Building Erection	Off-Highway Tractors	4	8.00	124	0.44
Metal Building Erection	Rough Terrain Forklifts	1	8.00	100	0.40
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Rough Grade	15	28.00	114.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Base for Paving	5	13.00	124.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving - Asphalt	5	13.00	56.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Concrete Foundations/Slab on	5	13.00	60.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Metal Building Erection	25	224.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	45.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Rough Grade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2235	0.0000	0.2235	0.0906	0.0000	0.0906	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1495	1.5633	1.0955	2.0200e-003		0.0730	0.0730		0.0681	0.0681	0.0000	176.9713	176.9713	0.0497	0.0000	178.2142
Total	**0.1495**	**1.5633**	**1.0955**	**2.0200e-003**	**0.2235**	**0.0730**	**0.2965**	**0.0906**	**0.0681**	**0.1588**	**0.0000**	**176.9713**	**176.9713**	**0.0497**	**0.0000**	**178.2142**

3.2 Rough Grade - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0105	0.3390	0.0669	8.3000e-004	0.0186	1.4800e-003	0.0201	5.3900e-003	1.4200e-003	6.8000e-003	0.0000	78.6699	78.6699	3.8500e-003	0.0000	78.7662
Worker	2.4300e-003	1.7000e-003	0.0182	5.0000e-005	5.5000e-003	4.0000e-005	5.5300e-003	1.4600e-003	3.0000e-005	1.5000e-003	0.0000	4.7445	4.7445	1.2000e-004	0.0000	4.7475
Total	**0.0129**	**0.3407**	**0.0851**	**8.8000e-004**	**0.0241**	**1.5200e-003**	**0.0256**	**6.8500e-003**	**1.4500e-003**	**8.3000e-003**	**0.0000**	**83.4144**	**83.4144**	**3.9700e-003**	**0.0000**	**83.5136**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1006	0.0000	0.1006	0.0408	0.0000	0.0408	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1495	1.5633	1.0955	2.0200e-003		0.0730	0.0730		0.0681	0.0681	0.0000	176.9711	176.9711	0.0497	0.0000	178.2140
Total	**0.1495**	**1.5633**	**1.0955**	**2.0200e-003**	**0.1006**	**0.0730**	**0.1736**	**0.0408**	**0.0681**	**0.1089**	**0.0000**	**176.9711**	**176.9711**	**0.0497**	**0.0000**	**178.2140**

3.2 Rough Grade - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0105	0.3390	0.0669	8.3000e-004	0.0186	1.4800e-003	0.0201	5.3900e-003	1.4200e-003	6.8000e-003	0.0000	78.6699	78.6699	3.8500e-003	0.0000	78.7662
Worker	2.4300e-003	1.7000e-003	0.0182	5.0000e-005	5.5000e-003	4.0000e-005	5.5300e-003	1.4600e-003	3.0000e-005	1.5000e-003	0.0000	4.7445	4.7445	1.2000e-004	0.0000	4.7475
Total	**0.0129**	**0.3407**	**0.0851**	**8.8000e-004**	**0.0241**	**1.5200e-003**	**0.0256**	**6.8500e-003**	**1.4500e-003**	**8.3000e-003**	**0.0000**	**83.4144**	**83.4144**	**3.9700e-003**	**0.0000**	**83.5136**

3.3 Base for Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4300e-003	0.0377	0.0224	5.0000e-005		1.7300e-003	1.7300e-003		1.5900e-003	1.5900e-003	0.0000	4.4736	4.4736	1.4500e-003	0.0000	4.5098
Paving	0.0122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0156**	**0.0377**	**0.0224**	**5.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.5900e-003**	**1.5900e-003**	**0.0000**	**4.4736**	**4.4736**	**1.4500e-003**	**0.0000**	**4.5098**

3.3 Base for Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1400e-003	0.0369	7.2800e-003	9.0000e-005	2.0200e-003	1.6000e-004	2.1800e-003	5.9000e-004	1.5000e-004	7.4000e-004	0.0000	8.5571	8.5571	4.2000e-004	0.0000	8.5676
Worker	1.1000e-004	8.0000e-005	8.4000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2203	0.2203	1.0000e-005	0.0000	0.2204
Total	**1.2500e-003**	**0.0370**	**8.1200e-003**	**9.0000e-005**	**2.2800e-003**	**1.6000e-004**	**2.4400e-003**	**6.6000e-004**	**1.5000e-004**	**8.1000e-004**	**0.0000**	**8.7774**	**8.7774**	**4.3000e-004**	**0.0000**	**8.7880**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4300e-003	0.0377	0.0224	5.0000e-005		1.7300e-003	1.7300e-003		1.5900e-003	1.5900e-003	0.0000	4.4736	4.4736	1.4500e-003	0.0000	4.5098
Paving	0.0122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0156**	**0.0377**	**0.0224**	**5.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.5900e-003**	**1.5900e-003**	**0.0000**	**4.4736**	**4.4736**	**1.4500e-003**	**0.0000**	**4.5098**

3.3 Base for Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1400e-003	0.0369	7.2800e-003	9.0000e-005	2.0200e-003	1.6000e-004	2.1800e-003	5.9000e-004	1.5000e-004	7.4000e-004	0.0000	8.5571	8.5571	4.2000e-004	0.0000	8.5676
Worker	1.1000e-004	8.0000e-005	8.4000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2203	0.2203	1.0000e-005	0.0000	0.2204
Total	**1.2500e-003**	**0.0370**	**8.1200e-003**	**9.0000e-005**	**2.2800e-003**	**1.6000e-004**	**2.4400e-003**	**6.6000e-004**	**1.5000e-004**	**8.1000e-004**	**0.0000**	**8.7774**	**8.7774**	**4.3000e-004**	**0.0000**	**8.7880**

3.4 Paving - Asphalt - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0100e-003	0.0320	0.0246	5.0000e-005		1.6300e-003	1.6300e-003		1.5000e-003	1.5000e-003	0.0000	3.9959	3.9959	1.2900e-003	0.0000	4.0282
Paving	0.0122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0152**	**0.0320**	**0.0246**	**5.0000e-005**		**1.6300e-003**	**1.6300e-003**		**1.5000e-003**	**1.5000e-003**	**0.0000**	**3.9959**	**3.9959**	**1.2900e-003**	**0.0000**	**4.0282**

3.4 Paving - Asphalt - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-004	0.0167	3.2900e-003	4.0000e-005	9.1000e-004	7.0000e-005	9.9000e-004	2.6000e-004	7.0000e-005	3.3000e-004	0.0000	3.8645	3.8645	1.9000e-004	0.0000	3.8692
Worker	1.1000e-004	8.0000e-005	8.4000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2203	0.2203	1.0000e-005	0.0000	0.2204
Total	**6.3000e-004**	**0.0167**	**4.1300e-003**	**4.0000e-005**	**1.1700e-003**	**7.0000e-005**	**1.2500e-003**	**3.3000e-004**	**7.0000e-005**	**4.0000e-004**	**0.0000**	**4.0848**	**4.0848**	**2.0000e-004**	**0.0000**	**4.0896**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0100e-003	0.0320	0.0246	5.0000e-005		1.6300e-003	1.6300e-003		1.5000e-003	1.5000e-003	0.0000	3.9959	3.9959	1.2900e-003	0.0000	4.0282
Paving	0.0122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0152**	**0.0320**	**0.0246**	**5.0000e-005**		**1.6300e-003**	**1.6300e-003**		**1.5000e-003**	**1.5000e-003**	**0.0000**	**3.9959**	**3.9959**	**1.2900e-003**	**0.0000**	**4.0282**

3.4 Paving - Asphalt - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-004	0.0167	3.2900e-003	4.0000e-005	9.1000e-004	7.0000e-005	9.9000e-004	2.6000e-004	7.0000e-005	3.3000e-004	0.0000	3.8645	3.8645	1.9000e-004	0.0000	3.8692
Worker	1.1000e-004	8.0000e-005	8.4000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2203	0.2203	1.0000e-005	0.0000	0.2204
Total	**6.3000e-004**	**0.0167**	**4.1300e-003**	**4.0000e-005**	**1.1700e-003**	**7.0000e-005**	**1.2500e-003**	**3.3000e-004**	**7.0000e-005**	**4.0000e-004**	**0.0000**	**4.0848**	**4.0848**	**2.0000e-004**	**0.0000**	**4.0896**

3.5 Concrete Foundations/Slab on Grade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6900e-003	0.0818	0.0825	1.2000e-004		4.0800e-003	4.0800e-003		3.7500e-003	3.7500e-003	0.0000	10.9729	10.9729	3.5500e-003	0.0000	11.0616
Paving	0.0122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0199**	**0.0818**	**0.0825**	**1.2000e-004**		**4.0800e-003**	**4.0800e-003**		**3.7500e-003**	**3.7500e-003**	**0.0000**	**10.9729**	**10.9729**	**3.5500e-003**	**0.0000**	**11.0616**

3.5 Concrete Foundations/Slab on Grade - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-003	0.0357	7.0400e-003	9.0000e-005	1.9600e-003	1.6000e-004	2.1100e-003	5.7000e-004	1.5000e-004	7.2000e-004	0.0000	8.2810	8.2810	4.1000e-004	0.0000	8.2912
Worker	2.3000e-004	1.6000e-004	1.6900e-003	0.0000	5.1000e-004	0.0000	5.1000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4406	0.4406	1.0000e-005	0.0000	0.4408
Total	**1.3300e-003**	**0.0359**	**8.7300e-003**	**9.0000e-005**	**2.4700e-003**	**1.6000e-004**	**2.6200e-003**	**7.1000e-004**	**1.5000e-004**	**8.6000e-004**	**0.0000**	**8.7216**	**8.7216**	**4.2000e-004**	**0.0000**	**8.7320**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6900e-003	0.0818	0.0825	1.2000e-004		4.0800e-003	4.0800e-003		3.7500e-003	3.7500e-003	0.0000	10.9729	10.9729	3.5500e-003	0.0000	11.0616
Paving	0.0122					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0199**	**0.0818**	**0.0825**	**1.2000e-004**		**4.0800e-003**	**4.0800e-003**		**3.7500e-003**	**3.7500e-003**	**0.0000**	**10.9729**	**10.9729**	**3.5500e-003**	**0.0000**	**11.0616**

3.5 Concrete Foundations/Slab on Grade - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-003	0.0357	7.0400e-003	9.0000e-005	1.9600e-003	1.6000e-004	2.1100e-003	5.7000e-004	1.5000e-004	7.2000e-004	0.0000	8.2810	8.2810	4.1000e-004	0.0000	8.2912
Worker	2.3000e-004	1.6000e-004	1.6900e-003	0.0000	5.1000e-004	0.0000	5.1000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4406	0.4406	1.0000e-005	0.0000	0.4408
Total	**1.3300e-003**	**0.0359**	**8.7300e-003**	**9.0000e-005**	**2.4700e-003**	**1.6000e-004**	**2.6200e-003**	**7.1000e-004**	**1.5000e-004**	**8.6000e-004**	**0.0000**	**8.7216**	**8.7216**	**4.2000e-004**	**0.0000**	**8.7320**

3.6 Metal Building Erection - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0290	0.3254	0.4133	6.2000e-004		0.0152	0.0152		0.0139	0.0139	0.0000	54.5076	54.5076	0.0176	0.0000	54.9483
Total	**0.0290**	**0.3254**	**0.4133**	**6.2000e-004**		**0.0152**	**0.0152**		**0.0139**	**0.0139**	**0.0000**	**54.5076**	**54.5076**	**0.0176**	**0.0000**	**54.9483**

3.6 Metal Building Erection - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4000e-004	0.0238	4.6900e-003	6.0000e-005	1.3100e-003	1.0000e-004	1.4100e-003	3.8000e-004	1.0000e-004	4.8000e-004	0.0000	5.5207	5.5207	2.7000e-004	0.0000	5.5275
Worker	7.7600e-003	5.4300e-003	0.0582	1.7000e-004	0.0176	1.2000e-004	0.0177	4.6800e-003	1.1000e-004	4.7900e-003	0.0000	15.1825	15.1825	3.7000e-004	0.0000	15.1918
Total	**8.5000e-003**	**0.0292**	**0.0628**	**2.3000e-004**	**0.0189**	**2.2000e-004**	**0.0191**	**5.0600e-003**	**2.1000e-004**	**5.2700e-003**	**0.0000**	**20.7032**	**20.7032**	**6.4000e-004**	**0.0000**	**20.7193**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0290	0.3254	0.4133	6.2000e-004		0.0152	0.0152		0.0139	0.0139	0.0000	54.5075	54.5075	0.0176	0.0000	54.9482
Total	**0.0290**	**0.3254**	**0.4133**	**6.2000e-004**		**0.0152**	**0.0152**		**0.0139**	**0.0139**	**0.0000**	**54.5075**	**54.5075**	**0.0176**	**0.0000**	**54.9482**

3.6 Metal Building Erection - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4000e-004	0.0238	4.6900e-003	6.0000e-005	1.3100e-003	1.0000e-004	1.4100e-003	3.8000e-004	1.0000e-004	4.8000e-004	0.0000	5.5207	5.5207	2.7000e-004	0.0000	5.5275
Worker	7.7600e-003	5.4300e-003	0.0582	1.7000e-004	0.0176	1.2000e-004	0.0177	4.6800e-003	1.1000e-004	4.7900e-003	0.0000	15.1825	15.1825	3.7000e-004	0.0000	15.1918
Total	**8.5000e-003**	**0.0292**	**0.0628**	**2.3000e-004**	**0.0189**	**2.2000e-004**	**0.0191**	**5.0600e-003**	**2.1000e-004**	**5.2700e-003**	**0.0000**	**20.7032**	**20.7032**	**6.4000e-004**	**0.0000**	**20.7193**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7952					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2300e-003	0.0225	0.0244	4.0000e-005		1.4800e-003	1.4800e-003		1.4800e-003	1.4800e-003	0.0000	3.4043	3.4043	2.6000e-004	0.0000	3.4109
Total	**0.7984**	**0.0225**	**0.0244**	**4.0000e-005**		**1.4800e-003**	**1.4800e-003**		**1.4800e-003**	**1.4800e-003**	**0.0000**	**3.4043**	**3.4043**	**2.6000e-004**	**0.0000**	**3.4109**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5600e-003	1.0900e-003	0.0117	3.0000e-005	3.5300e-003	2.0000e-005	3.5600e-003	9.4000e-004	2.0000e-005	9.6000e-004	0.0000	3.0501	3.0501	8.0000e-005	0.0000	3.0519
Total	**1.5600e-003**	**1.0900e-003**	**0.0117**	**3.0000e-005**	**3.5300e-003**	**2.0000e-005**	**3.5600e-003**	**9.4000e-004**	**2.0000e-005**	**9.6000e-004**	**0.0000**	**3.0501**	**3.0501**	**8.0000e-005**	**0.0000**	**3.0519**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7952					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2300e-003	0.0225	0.0244	4.0000e-005		1.4800e-003	1.4800e-003		1.4800e-003	1.4800e-003	0.0000	3.4043	3.4043	2.6000e-004	0.0000	3.4109
Total	**0.7984**	**0.0225**	**0.0244**	**4.0000e-005**		**1.4800e-003**	**1.4800e-003**		**1.4800e-003**	**1.4800e-003**	**0.0000**	**3.4043**	**3.4043**	**2.6000e-004**	**0.0000**	**3.4109**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5600e-003	1.0900e-003	0.0117	3.0000e-005	3.5300e-003	2.0000e-005	3.5600e-003	9.4000e-004	2.0000e-005	9.6000e-004	0.0000	3.0501	3.0501	8.0000e-005	0.0000	3.0519
Total	**1.5600e-003**	**1.0900e-003**	**0.0117**	**3.0000e-005**	**3.5300e-003**	**2.0000e-005**	**3.5600e-003**	**9.4000e-004**	**2.0000e-005**	**9.6000e-004**	**0.0000**	**3.0501**	**3.0501**	**8.0000e-005**	**0.0000**	**3.0519**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7685	5.2375	8.3209	0.0285	2.0022	0.0314	2.0336	0.5386	0.0296	0.5682	0.0000	2,620.3947	2,620.3947	0.1170	0.0000	2,623.3204
Unmitigated	0.7685	5.2375	8.3209	0.0285	2.0022	0.0314	2.0336	0.5386	0.0296	0.5682	0.0000	2,620.3947	2,620.3947	0.1170	0.0000	2,623.3204

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Discount Club	2,356.00	2,433.50	2433.50	5,386,385	5,386,385
Gasoline/Service Station	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	2,356.00	2,433.50	2,433.50	5,386,385	5,386,385

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Discount Club	7.80	16.00	0.00	19.90	80.10	0.00	35.2	31.5	33.3
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Discount Club	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Gasoline/Service Station	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Other Asphalt Surfaces	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Parking Lot	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	573.7233	573.7233	0.0259	5.3700e-003	575.9714
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	573.7233	573.7233	0.0259	5.3700e-003	575.9714
NaturalGas Mitigated	0.0102	0.0928	0.0779	5.6000e-004		7.0500e-003	7.0500e-003		7.0500e-003	7.0500e-003	0.0000	100.9881	100.9881	1.9400e-003	1.8500e-003	101.5882
NaturalGas Unmitigated	0.0102	0.0928	0.0779	5.6000e-004		7.0500e-003	7.0500e-003		7.0500e-003	7.0500e-003	0.0000	100.9881	100.9881	1.9400e-003	1.8500e-003	101.5882

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Discount Club	1.8135e+006	9.7800e-003	0.0889	0.0747	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003	0.0000	96.7753	96.7753	1.8500e-003	1.7700e-003	97.3504
Gasoline/Service Station	78945.1	4.3000e-004	3.8700e-003	3.2500e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	4.2128	4.2128	8.0000e-005	8.0000e-005	4.2378
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0102**	**0.0928**	**0.0779**	**5.5000e-004**		**7.0500e-003**	**7.0500e-003**		**7.0500e-003**	**7.0500e-003**	**0.0000**	**100.9881**	**100.9881**	**1.9300e-003**	**1.8500e-003**	**101.5882**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Discount Club	1.8135e+006	9.7800e-003	0.0889	0.0747	5.3000e-004		6.7600e-003	6.7600e-003		6.7600e-003	6.7600e-003	0.0000	96.7753	96.7753	1.8500e-003	1.7700e-003	97.3504
Gasoline/Service Station	78945.1	4.3000e-004	3.8700e-003	3.2500e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	4.2128	4.2128	8.0000e-005	8.0000e-005	4.2378
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0102**	**0.0928**	**0.0779**	**5.5000e-004**		**7.0500e-003**	**7.0500e-003**		**7.0500e-003**	**7.0500e-003**	**0.0000**	**100.9881**	**100.9881**	**1.9300e-003**	**1.8500e-003**	**101.5882**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Discount Club	1.82745e+006	531.6262	0.0240	4.9700e-003	533.7092
Gasoline/Service Station	35787.9	10.4111	4.7000e-004	1.0000e-004	10.4519
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	108920	31.6861	1.4300e-003	3.0000e-004	31.8102
Total		**573.7233**	**0.0259**	**5.3700e-003**	**575.9714**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Discount Club	1.82745e+006	531.6262	0.0240	4.9700e-003	533.7092
Gasoline/Service Station	35787.9	10.4111	4.7000e-004	1.0000e-004	10.4519
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	108920	31.6861	1.4300e-003	3.0000e-004	31.8102
Total		**573.7233**	**0.0259**	**5.3700e-003**	**575.9714**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7288	8.0000e-005	8.9300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0173	0.0173	5.0000e-005	0.0000	0.0184
Unmitigated	0.7288	8.0000e-005	8.9300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0173	0.0173	5.0000e-005	0.0000	0.0184

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0795					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6485					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.4000e-004	8.0000e-005	8.9300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0173	0.0173	5.0000e-005	0.0000	0.0184
Total	**0.7288**	**8.0000e-005**	**8.9300e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0173**	**0.0173**	**5.0000e-005**	**0.0000**	**0.0184**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0795					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6485					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.4000e-004	8.0000e-005	8.9300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0173	0.0173	5.0000e-005	0.0000	0.0184
Total	**0.7288**	**8.0000e-005**	**8.9300e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0173**	**0.0173**	**5.0000e-005**	**0.0000**	**0.0184**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	29.8825	0.3883	9.3800e-003	42.3862
Unmitigated	29.8825	0.3883	9.3800e-003	42.3862

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Discount Club	11.4812 / 7.03689	28.8802	0.3753	9.0700e-003	40.9645
Gasoline/Service Station	0.398457 / 0.244215	1.0023	0.0130	3.1000e-004	1.4217
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**29.8825**	**0.3883**	**9.3800e-003**	**42.3861**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Discount Club	11.4812 / 7.03689	28.8802	0.3753	9.0700e-003	40.9645
Gasoline/Service Station	0.398457 / 0.244215	1.0023	0.0130	3.1000e-004	1.4217
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**29.8825**	**0.3883**	**9.3800e-003**	**42.3861**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	138.5982	8.1909	0.0000	343.3711
Unmitigated	138.5982	8.1909	0.0000	343.3711

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Discount Club	666.61	135.3158	7.9969	0.0000	335.2392
Gasoline/Service Station	16.17	3.2824	0.1940	0.0000	8.1319
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**138.5982**	**8.1909**	**0.0000**	**343.3711**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Discount Club	666.61	135.3158	7.9969	0.0000	335.2392
Gasoline/Service Station	16.17	3.2824	0.1940	0.0000	8.1319
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**138.5982**	**8.1909**	**0.0000**	**343.3711**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Loomis Costco No Project/Future Development Scenario

Placer-Sacramento County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	25.00	1000sqft	0.57	25,000.00	0
Parking Lot	11.28	Acre	11.28	491,356.80	0
High Turnover (Sit Down Restaurant)	10.00	1000sqft	0.23	10,000.00	0
Condo/Townhouse	35.00	Dwelling Unit	3.77	35,000.00	100
Regional Shopping Center	75.00	1000sqft	1.72	75,000.00	0
Other Asphalt Surfaces	0.36	Acre	0.36	15,681.60	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Alternative 1B conceptual no project/future development land use scenario. Other asphalt surfaces used to model off-site improvements project.

Construction Phase - Construction schedule and equipment based on CalEEMod defaults.

Vehicle Trips -

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	2.19	3.77

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.4768	4.5848	3.5643	9.9500e-003	0.6223	0.1754	0.7977	0.2380	0.1641	0.4021	0.0000	899.6849	899.6849	0.1159	0.0000	902.5835
2021	1.0176	1.3055	1.1782	3.3600e-003	0.1199	0.0468	0.1666	0.0325	0.0439	0.0764	0.0000	304.3304	304.3304	0.0355	0.0000	305.2187
Maximum	**1.0176**	**4.5848**	**3.5643**	**9.9500e-003**	**0.6223**	**0.1754**	**0.7977**	**0.2380**	**0.1641**	**0.4021**	**0.0000**	**899.6849**	**899.6849**	**0.1159**	**0.0000**	**902.5835**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.4768	4.5848	3.5643	9.9500e-003	0.6223	0.1754	0.7977	0.2380	0.1641	0.4021	0.0000	899.6845	899.6845	0.1159	0.0000	902.5830
2021	1.0176	1.3055	1.1782	3.3600e-003	0.1199	0.0468	0.1666	0.0325	0.0439	0.0764	0.0000	304.3302	304.3302	0.0355	0.0000	305.2186
Maximum	**1.0176**	**4.5848**	**3.5643**	**9.9500e-003**	**0.6223**	**0.1754**	**0.7977**	**0.2380**	**0.1641**	**0.4021**	**0.0000**	**899.6845**	**899.6845**	**0.1159**	**0.0000**	**902.5830**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2020**	**3-31-2020**	1.5073	1.5073
2	**4-1-2020**	**6-30-2020**	1.1679	1.1679
3	**7-1-2020**	**9-30-2020**	1.1808	1.1808
4	**10-1-2020**	**12-31-2020**	1.1897	1.1897
5	**1-1-2021**	**3-31-2021**	1.0595	1.0595
6	**4-1-2021**	**6-30-2021**	1.2750	1.2750
		Highest	1.5073	1.5073

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.5169	0.0582	3.7470	6.3300e-003		0.4901	0.4901		0.4901	0.4901	46.4831	19.9210	66.4041	0.0433	3.6600e-003	68.5765
Energy	0.0167	0.1500	0.1122	9.1000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	689.5439	689.5439	0.0269	7.9400e-003	692.5808
Mobile	1.7043	10.1403	16.7025	0.0460	2.9820	0.0644	3.0464	0.8020	0.0610	0.8630	0.0000	4,219.5668	4,219.5668	0.2346	0.0000	4,225.4310
Waste						0.0000	0.0000		0.0000	0.0000	49.0629	0.0000	49.0629	2.8995	0.0000	121.5513
Water						0.0000	0.0000		0.0000	0.0000	5.0653	33.4516	38.5169	0.5218	0.0126	55.3150
Total	**5.2379**	**10.3485**	**20.5617**	**0.0532**	**2.9820**	**0.5661**	**3.5481**	**0.8020**	**0.5627**	**1.3647**	**100.6113**	**4,962.4832**	**5,063.0945**	**3.7261**	**0.0242**	**5,163.4547**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.5169	0.0582	3.7470	6.3300e-003		0.4901	0.4901		0.4901	0.4901	46.4831	19.9210	66.4041	0.0433	3.6600e-003	68.5765
Energy	0.0167	0.1500	0.1122	9.1000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	689.5439	689.5439	0.0269	7.9400e-003	692.5808
Mobile	1.7043	10.1403	16.7025	0.0460	2.9820	0.0644	3.0464	0.8020	0.0610	0.8630	0.0000	4,219.5668	4,219.5668	0.2346	0.0000	4,225.4310
Waste						0.0000	0.0000		0.0000	0.0000	49.0629	0.0000	49.0629	2.8995	0.0000	121.5513
Water						0.0000	0.0000		0.0000	0.0000	5.0653	33.4516	38.5169	0.5218	0.0126	55.3150
Total	**5.2379**	**10.3485**	**20.5617**	**0.0532**	**2.9820**	**0.5661**	**3.5481**	**0.8020**	**0.5627**	**1.3647**	**100.6113**	**4,962.4832**	**5,063.0945**	**3.7261**	**0.0242**	**5,163.4547**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2020	1/14/2020	5	10	
2	Grading	Grading	1/15/2020	2/25/2020	5	30	
3	Building Construction	Building Construction	2/26/2020	4/20/2021	5	300	
4	Paving	Paving	4/21/2021	5/18/2021	5	20	
5	Architectural Coating	Architectural Coating	5/19/2021	6/15/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 55

Acres of Paving: 11.64

Residential Indoor: 91,125; Residential Outdoor: 30,375; Non-Residential Indoor: 165,000; Non-Residential Outdoor: 55,000; Striped Parking Area: 30,710 (Architectural Coating – sqft)

OffRoad Equipment

Loomis Costco No Project/Future Development Scenario - Placer-Sacramento County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	284.00	107.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	57.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1987	0.0000	0.1987	0.1092	0.0000	0.1092	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.1987**	**0.0110**	**0.2097**	**0.1092**	**0.0101**	**0.1194**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.2000e-004	2.3400e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6100	0.6100	2.0000e-005	0.0000	0.6104
Total	**3.1000e-004**	**2.2000e-004**	**2.3400e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6100**	**0.6100**	**2.0000e-005**	**0.0000**	**0.6104**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1987	0.0000	0.1987	0.1092	0.0000	0.1092	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.1987**	**0.0110**	**0.2097**	**0.1092**	**0.0101**	**0.1194**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.2000e-004	2.3400e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6100	0.6100	2.0000e-005	0.0000	0.6104
Total	**3.1000e-004**	**2.2000e-004**	**2.3400e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6100**	**0.6100**	**2.0000e-005**	**0.0000**	**0.6104**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0668	0.7530	0.4794	9.3000e-004		0.0326	0.0326		0.0300	0.0300	0.0000	81.7264	81.7264	0.0264	0.0000	82.3872
Total	**0.0668**	**0.7530**	**0.4794**	**9.3000e-004**	**0.0954**	**0.0326**	**0.1280**	**0.0396**	**0.0300**	**0.0696**	**0.0000**	**81.7264**	**81.7264**	**0.0264**	**0.0000**	**82.3872**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	7.3000e-004	7.7900e-003	2.0000e-005	2.3600e-003	2.0000e-005	2.3700e-003	6.3000e-004	1.0000e-005	6.4000e-004	0.0000	2.0334	2.0334	5.0000e-005	0.0000	2.0346
Total	**1.0400e-003**	**7.3000e-004**	**7.7900e-003**	**2.0000e-005**	**2.3600e-003**	**2.0000e-005**	**2.3700e-003**	**6.3000e-004**	**1.0000e-005**	**6.4000e-004**	**0.0000**	**2.0334**	**2.0334**	**5.0000e-005**	**0.0000**	**2.0346**

3.3 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0954	0.0000	0.0954	0.0396	0.0000	0.0396	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0668	0.7530	0.4794	9.3000e-004		0.0326	0.0326		0.0300	0.0300	0.0000	81.7263	81.7263	0.0264	0.0000	82.3871
Total	**0.0668**	**0.7530**	**0.4794**	**9.3000e-004**	**0.0954**	**0.0326**	**0.1280**	**0.0396**	**0.0300**	**0.0696**	**0.0000**	**81.7263**	**81.7263**	**0.0264**	**0.0000**	**82.3871**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	7.3000e-004	7.7900e-003	2.0000e-005	2.3600e-003	2.0000e-005	2.3700e-003	6.3000e-004	1.0000e-005	6.4000e-004	0.0000	2.0334	2.0334	5.0000e-005	0.0000	2.0346
Total	**1.0400e-003**	**7.3000e-004**	**7.7900e-003**	**2.0000e-005**	**2.3600e-003**	**2.0000e-005**	**2.3700e-003**	**6.3000e-004**	**1.0000e-005**	**6.4000e-004**	**0.0000**	**2.0334**	**2.0334**	**5.0000e-005**	**0.0000**	**2.0346**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2353	2.1297	1.8702	2.9900e-003		0.1240	0.1240		0.1166	0.1166	0.0000	257.0871	257.0871	0.0627	0.0000	258.6551
Total	**0.2353**	**2.1297**	**1.8702**	**2.9900e-003**		**0.1240**	**0.1240**		**0.1166**	**0.1166**	**0.0000**	**257.0871**	**257.0871**	**0.0627**	**0.0000**	**258.6551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0438	1.4128	0.2787	3.4500e-003	0.0775	6.1700e-003	0.0837	0.0225	5.9000e-003	0.0284	0.0000	327.8464	327.8464	0.0161	0.0000	328.2477
Worker	0.1092	0.0764	0.8183	2.3600e-003	0.2476	1.6500e-003	0.2492	0.0659	1.5200e-003	0.0674	0.0000	213.6663	213.6663	5.2700e-003	0.0000	213.7979
Total	**0.1530**	**1.4892**	**1.0971**	**5.8100e-003**	**0.3251**	**7.8200e-003**	**0.3329**	**0.0883**	**7.4200e-003**	**0.0958**	**0.0000**	**541.5126**	**541.5126**	**0.0213**	**0.0000**	**542.0456**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2353	2.1297	1.8702	2.9900e-003		0.1240	0.1240		0.1166	0.1166	0.0000	257.0868	257.0868	0.0627	0.0000	258.6548
Total	**0.2353**	**2.1297**	**1.8702**	**2.9900e-003**		**0.1240**	**0.1240**		**0.1166**	**0.1166**	**0.0000**	**257.0868**	**257.0868**	**0.0627**	**0.0000**	**258.6548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0438	1.4128	0.2787	3.4500e-003	0.0775	6.1700e-003	0.0837	0.0225	5.9000e-003	0.0284	0.0000	327.8464	327.8464	0.0161	0.0000	328.2477
Worker	0.1092	0.0764	0.8183	2.3600e-003	0.2476	1.6500e-003	0.2492	0.0659	1.5200e-003	0.0674	0.0000	213.6663	213.6663	5.2700e-003	0.0000	213.7979
Total	**0.1530**	**1.4892**	**1.0971**	**5.8100e-003**	**0.3251**	**7.8200e-003**	**0.3329**	**0.0883**	**7.4200e-003**	**0.0958**	**0.0000**	**541.5126**	**541.5126**	**0.0213**	**0.0000**	**542.0456**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0741	0.6799	0.6464	1.0500e-003		0.0374	0.0374		0.0352	0.0352	0.0000	90.3385	90.3385	0.0218	0.0000	90.8834
Total	**0.0741**	**0.6799**	**0.6464**	**1.0500e-003**		**0.0374**	**0.0374**		**0.0352**	**0.0352**	**0.0000**	**90.3385**	**90.3385**	**0.0218**	**0.0000**	**90.8834**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.4556	0.0870	1.2000e-003	0.0272	1.0400e-003	0.0283	7.8900e-003	1.0000e-003	8.8800e-003	0.0000	114.2759	114.2759	5.3300e-003	0.0000	114.4090
Worker	0.0357	0.0240	0.2630	8.0000e-004	0.0870	5.6000e-004	0.0875	0.0232	5.2000e-004	0.0237	0.0000	72.4308	72.4308	1.6500e-003	0.0000	72.4722
Total	**0.0486**	**0.4796**	**0.3500**	**2.0000e-003**	**0.1142**	**1.6000e-003**	**0.1158**	**0.0310**	**1.5200e-003**	**0.0326**	**0.0000**	**186.7067**	**186.7067**	**6.9800e-003**	**0.0000**	**186.8812**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0741	0.6799	0.6464	1.0500e-003		0.0374	0.0374		0.0352	0.0352	0.0000	90.3384	90.3384	0.0218	0.0000	90.8833
Total	**0.0741**	**0.6799**	**0.6464**	**1.0500e-003**		**0.0374**	**0.0374**		**0.0352**	**0.0352**	**0.0000**	**90.3384**	**90.3384**	**0.0218**	**0.0000**	**90.8833**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.4556	0.0870	1.2000e-003	0.0272	1.0400e-003	0.0283	7.8900e-003	1.0000e-003	8.8800e-003	0.0000	114.2759	114.2759	5.3300e-003	0.0000	114.4090
Worker	0.0357	0.0240	0.2630	8.0000e-004	0.0870	5.6000e-004	0.0875	0.0232	5.2000e-004	0.0237	0.0000	72.4308	72.4308	1.6500e-003	0.0000	72.4722
Total	**0.0486**	**0.4796**	**0.3500**	**2.0000e-003**	**0.1142**	**1.6000e-003**	**0.1158**	**0.0310**	**1.5200e-003**	**0.0326**	**0.0000**	**186.7067**	**186.7067**	**6.9800e-003**	**0.0000**	**186.8812**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0153					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0278**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	3.3000e-004	3.5600e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9809	0.9809	2.0000e-005	0.0000	0.9815
Total	**4.8000e-004**	**3.3000e-004**	**3.5600e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1900e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9809**	**0.9809**	**2.0000e-005**	**0.0000**	**0.9815**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0153					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0278**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	3.3000e-004	3.5600e-003	1.0000e-005	1.1800e-003	1.0000e-005	1.1900e-003	3.1000e-004	1.0000e-005	3.2000e-004	0.0000	0.9809	0.9809	2.0000e-005	0.0000	0.9815
Total	**4.8000e-004**	**3.3000e-004**	**3.5600e-003**	**1.0000e-005**	**1.1800e-003**	**1.0000e-005**	**1.1900e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9809**	**0.9809**	**2.0000e-005**	**0.0000**	**0.9815**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8626					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**0.8648**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	1.2400e-003	0.0135	4.0000e-005	4.4800e-003	3.0000e-005	4.5100e-003	1.1900e-003	3.0000e-005	1.2200e-003	0.0000	3.7275	3.7275	9.0000e-005	0.0000	3.7296
Total	**1.8400e-003**	**1.2400e-003**	**0.0135**	**4.0000e-005**	**4.4800e-003**	**3.0000e-005**	**4.5100e-003**	**1.1900e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.7275**	**3.7275**	**9.0000e-005**	**0.0000**	**3.7296**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8626					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**0.8648**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	1.2400e-003	0.0135	4.0000e-005	4.4800e-003	3.0000e-005	4.5100e-003	1.1900e-003	3.0000e-005	1.2200e-003	0.0000	3.7275	3.7275	9.0000e-005	0.0000	3.7296
Total	**1.8400e-003**	**1.2400e-003**	**0.0135**	**4.0000e-005**	**4.4800e-003**	**3.0000e-005**	**4.5100e-003**	**1.1900e-003**	**3.0000e-005**	**1.2200e-003**	**0.0000**	**3.7275**	**3.7275**	**9.0000e-005**	**0.0000**	**3.7296**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.7043	10.1403	16.7025	0.0460	2.9820	0.0644	3.0464	0.8020	0.0610	0.8630	0.0000	4,219.5668	4,219.5668	0.2346	0.0000	4,225.4310
Unmitigated	1.7043	10.1403	16.7025	0.0460	2.9820	0.0644	3.0464	0.8020	0.0610	0.8630	0.0000	4,219.5668	4,219.5668	0.2346	0.0000	4,225.4310

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	203.35	198.45	169.40	566,607	566,607
General Office Building	275.75	61.50	26.25	500,653	500,653
High Turnover (Sit Down Restaurant)	1,271.50	1,583.70	1318.40	1,534,798	1,534,798
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	3,202.50	3,747.75	1893.00	5,423,535	5,423,535
Total	4,953.10	5,591.40	3,407.05	8,025,593	8,025,593

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	10.80	7.30	7.50	42.60	21.00	36.40	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
General Office Building	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
High Turnover (Sit Down Restaurant)	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
Parking Lot	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
Regional Shopping Center	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Loomis Costco No Project/Future Development Scenario - Placer-Sacramento County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	523.9883	523.9883	0.0237	4.9000e-003	526.0414
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	523.9883	523.9883	0.0237	4.9000e-003	526.0414
NaturalGas Mitigated	0.0167	0.1500	0.1122	9.1000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	165.5556	165.5556	3.1700e-003	3.0400e-003	166.5394
NaturalGas Unmitigated	0.0167	0.1500	0.1122	9.1000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	165.5556	165.5556	3.1700e-003	3.0400e-003	166.5394

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	719294	3.8800e-003	0.0331	0.0141	2.1000e-004		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	38.3843	38.3843	7.4000e-004	7.0000e-004	38.6124
General Office Building	411500	2.2200e-003	0.0202	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003	0.0000	21.9592	21.9592	4.2000e-004	4.0000e-004	22.0897
High Turnover (Sit Down Restaurant)	1.0941e+006	5.9000e-003	0.0536	0.0451	3.2000e-004		4.0800e-003	4.0800e-003		4.0800e-003	4.0800e-003	0.0000	58.3853	58.3853	1.1200e-003	1.0700e-003	58.7323
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	877500	4.7300e-003	0.0430	0.0361	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8267	46.8267	9.0000e-004	8.6000e-004	47.1050
Total		**0.0167**	**0.1500**	**0.1122**	**9.1000e-004**		**0.0116**	**0.0116**		**0.0116**	**0.0116**	**0.0000**	**165.5555**	**165.5555**	**3.1800e-003**	**3.0300e-003**	**166.5394**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	719294	3.8800e-003	0.0331	0.0141	2.1000e-004		2.6800e-003	2.6800e-003		2.6800e-003	2.6800e-003	0.0000	38.3843	38.3843	7.4000e-004	7.0000e-004	38.6124
General Office Building	411500	2.2200e-003	0.0202	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003	0.0000	21.9592	21.9592	4.2000e-004	4.0000e-004	22.0897
High Turnover (Sit Down Restaurant)	1.0941e+006	5.9000e-003	0.0536	0.0451	3.2000e-004		4.0800e-003	4.0800e-003		4.0800e-003	4.0800e-003	0.0000	58.3853	58.3853	1.1200e-003	1.0700e-003	58.7323
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	877500	4.7300e-003	0.0430	0.0361	2.6000e-004		3.2700e-003	3.2700e-003		3.2700e-003	3.2700e-003	0.0000	46.8267	46.8267	9.0000e-004	8.6000e-004	47.1050
Total		**0.0167**	**0.1500**	**0.1122**	**9.1000e-004**		**0.0116**	**0.0116**		**0.0116**	**0.0116**	**0.0000**	**165.5555**	**165.5555**	**3.1800e-003**	**3.0300e-003**	**166.5394**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	181220	52.7190	2.3800e-003	4.9000e-004	52.9256
General Office Building	250250	72.8006	3.2900e-003	6.8000e-004	73.0859
High Turnover (Sit Down Restaurant)	313500	91.2007	4.1200e-003	8.5000e-004	91.5581
Parking Lot	171975	50.0295	2.2600e-003	4.7000e-004	50.2255
Regional Shopping Center	884250	257.2385	0.0116	2.4100e-003	258.2464
Total		**523.9883**	**0.0237**	**4.9000e-003**	**526.0414**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	181220	52.7190	2.3800e-003	4.9000e-004	52.9256
General Office Building	250250	72.8006	3.2900e-003	6.8000e-004	73.0859
High Turnover (Sit Down Restaurant)	313500	91.2007	4.1200e-003	8.5000e-004	91.5581
Parking Lot	171975	50.0295	2.2600e-003	4.7000e-004	50.2255
Regional Shopping Center	884250	257.2385	0.0116	2.4100e-003	258.2464
Total		**523.9883**	**0.0237**	**4.9000e-003**	**526.0414**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.5169	0.0582	3.7470	6.3300e-003		0.4901	0.4901		0.4901	0.4901	46.4831	19.9210	66.4041	0.0433	3.6600e-003	68.5765
Unmitigated	3.5169	0.0582	3.7470	6.3300e-003		0.4901	0.4901		0.4901	0.4901	46.4831	19.9210	66.4041	0.0433	3.6600e-003	68.5765

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0863					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5991					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.8236	0.0551	3.4854	6.3100e-003		0.4887	0.4887		0.4887	0.4887	46.4831	19.4943	65.9774	0.0429	3.6600e-003	68.1394
Landscaping	8.0000e-003	3.0200e-003	0.2616	1.0000e-005		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	0.4267	0.4267	4.2000e-004	0.0000	0.4371
Total	**3.5169**	**0.0582**	**3.7470**	**6.3200e-003**		**0.4901**	**0.4901**		**0.4901**	**0.4901**	**46.4831**	**19.9210**	**66.4041**	**0.0433**	**3.6600e-003**	**68.5765**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0863					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5991					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.8236	0.0551	3.4854	6.3100e-003		0.4887	0.4887		0.4887	0.4887	46.4831	19.4943	65.9774	0.0429	3.6600e-003	68.1394
Landscaping	8.0000e-003	3.0200e-003	0.2616	1.0000e-005		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	0.4267	0.4267	4.2000e-004	0.0000	0.4371
Total	**3.5169**	**0.0582**	**3.7470**	**6.3200e-003**		**0.4901**	**0.4901**		**0.4901**	**0.4901**	**46.4831**	**19.9210**	**66.4041**	**0.0433**	**3.6600e-003**	**68.5765**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	38.5169	0.5218	0.0126	55.3150
Unmitigated	38.5169	0.5218	0.0126	55.3150

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.93193 / 1.84839	7.4274	0.0958	2.3200e-003	10.5135
General Office Building	4.44334 / 2.72334	11.1769	0.1452	3.5100e-003	15.8536
High Turnover (Sit Down Restaurant)	3.03534 / 0.193745	5.9382	0.0991	2.3800e-003	9.1263
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.55544 / 3.40495	13.9743	0.1816	4.3900e-003	19.8215
Total		**38.5169**	**0.5218**	**0.0126**	**55.3150**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.93193 / 1.84839	7.4274	0.0958	2.3200e-003	10.5135
General Office Building	4.44334 / 2.72334	11.1769	0.1452	3.5100e-003	15.8536
High Turnover (Sit Down Restaurant)	3.03534 / 0.193745	5.9382	0.0991	2.3800e-003	9.1263
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.55544 / 3.40495	13.9743	0.1816	4.3900e-003	19.8215
Total		**38.5169**	**0.5218**	**0.0126**	**55.3150**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	49.0629	2.8995	0.0000	121.5513
Unmitigated	49.0629	2.8995	0.0000	121.5513

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	20.7	4.2019	0.2483	0.0000	10.4101
General Office Building	23.25	4.7195	0.2789	0.0000	11.6925
High Turnover (Sit Down Restaurant)	119	24.1559	1.4276	0.0000	59.8453
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	78.75	15.9855	0.9447	0.0000	39.6035
Total		**49.0629**	**2.8995**	**0.0000**	**121.5513**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	20.7	4.2019	0.2483	0.0000	10.4101
General Office Building	23.25	4.7195	0.2789	0.0000	11.6925
High Turnover (Sit Down Restaurant)	119	24.1559	1.4276	0.0000	59.8453
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	78.75	15.9855	0.9447	0.0000	39.6035
Total		**49.0629**	**2.8995**	**0.0000**	**121.5513**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Loomis Costco No Project/Future Development Scenario

Placer-Sacramento County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	25.00	1000sqft	0.57	25,000.00	0
Parking Lot	11.28	Acre	11.28	491,356.80	0
High Turnover (Sit Down Restaurant)	10.00	1000sqft	0.23	10,000.00	0
Condo/Townhouse	35.00	Dwelling Unit	3.77	35,000.00	100
Regional Shopping Center	75.00	1000sqft	1.72	75,000.00	0
Other Asphalt Surfaces	0.36	Acre	0.36	15,681.60	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Alternative 1B conceptual no project/future development land use scenario. Other asphalt surfaces used to model off-site improvements project.

Construction Phase - Construction schedule and equipment based on CalEEMod defaults.

Vehicle Trips -

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	2.19	3.77

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.5278	50.2402	32.5452	0.0818	39.8936	2.1984	42.0920	21.8867	2.0225	23.9092	0.0000	8,180.3485	8,180.3485	1.9464	0.0000	8,201.1104
2021	86.6844	29.5097	26.2447	0.0807	3.0577	0.9992	4.0569	0.8275	0.9396	1.7671	0.0000	8,072.9620	8,072.9620	0.8092	0.0000	8,093.1910
Maximum	**86.6844**	**50.2402**	**32.5452**	**0.0818**	**39.8936**	**2.1984**	**42.0920**	**21.8867**	**2.0225**	**23.9092**	**0.0000**	**8,180.3485**	**8,180.3485**	**1.9464**	**0.0000**	**8,201.1104**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.5278	50.2402	32.5452	0.0818	39.8936	2.1984	42.0920	21.8867	2.0225	23.9092	0.0000	8,180.3485	8,180.3485	1.9464	0.0000	8,201.1104
2021	86.6844	29.5097	26.2447	0.0807	3.0577	0.9992	4.0569	0.8275	0.9396	1.7671	0.0000	8,072.9620	8,072.9620	0.8092	0.0000	8,093.1910
Maximum	**86.6844**	**50.2402**	**32.5452**	**0.0818**	**39.8936**	**2.1984**	**42.0920**	**21.8867**	**2.0225**	**23.9092**	**0.0000**	**8,180.3485**	**8,180.3485**	**1.9464**	**0.0000**	**8,201.1104**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251
Energy	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081
Mobile	13.6880	65.2598	113.1545	0.3239	20.5887	0.4221	21.0108	5.5168	0.3995	5.9163		32,761.0862	32,761.0862	1.6796		32,803.0749
Total	**86.4916**	**67.4599**	**201.6855**	**0.4831**	**20.5887**	**12.4206**	**33.0093**	**5.5168**	**12.3980**	**17.9148**	**1,249.7279**	**34,290.3956**	**35,540.1235**	**2.8571**	**0.1166**	**35,646.3080**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251
Energy	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081
Mobile	13.6880	65.2598	113.1545	0.3239	20.5887	0.4221	21.0108	5.5168	0.3995	5.9163		32,761.0862	32,761.0862	1.6796		32,803.0749
Total	**86.4916**	**67.4599**	**201.6855**	**0.4831**	**20.5887**	**12.4206**	**33.0093**	**5.5168**	**12.3980**	**17.9148**	**1,249.7279**	**34,290.3956**	**35,540.1235**	**2.8571**	**0.1166**	**35,646.3080**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2020	1/14/2020	5	10	
2	Grading	Grading	1/15/2020	2/25/2020	5	30	
3	Building Construction	Building Construction	2/26/2020	4/20/2021	5	300	
4	Paving	Paving	4/21/2021	5/18/2021	5	20	
5	Architectural Coating	Architectural Coating	5/19/2021	6/15/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 55

Acres of Paving: 11.64

Residential Indoor: 91,125; Residential Outdoor: 30,375; Non-Residential Indoor: 165,000; Non-Residential Outdoor: 55,000; Striped Parking Area: 30,710 (Architectural Coating – sqft)

OffRoad Equipment

Loomis Costco No Project/Future Development Scenario - Placer-Sacramento County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	284.00	107.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	57.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					39.7458	0.0000	39.7458	21.8475	0.0000	21.8475			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**39.7458**	**2.1974**	**41.9432**	**21.8475**	**2.0216**	**23.8691**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0699	0.0384	0.5282	1.4800e-003	0.1479	9.4000e-004	0.1488	0.0392	8.7000e-004	0.0401		147.3592	147.3592	3.6200e-003		147.4497
Total	**0.0699**	**0.0384**	**0.5282**	**1.4800e-003**	**0.1479**	**9.4000e-004**	**0.1488**	**0.0392**	**8.7000e-004**	**0.0401**		**147.3592**	**147.3592**	**3.6200e-003**		**147.4497**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					39.7458	0.0000	39.7458	21.8475	0.0000	21.8475			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**39.7458**	**2.1974**	**41.9432**	**21.8475**	**2.0216**	**23.8691**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0699	0.0384	0.5282	1.4800e-003	0.1479	9.4000e-004	0.1488	0.0392	8.7000e-004	0.0401		147.3592	147.3592	3.6200e-003		147.4497
Total	**0.0699**	**0.0384**	**0.5282**	**1.4800e-003**	**0.1479**	**9.4000e-004**	**0.1488**	**0.0392**	**8.7000e-004**	**0.0401**		**147.3592**	**147.3592**	**3.6200e-003**		**147.4497**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3605	0.0000	6.3605	2.6374	0.0000	2.6374			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3605**	**2.1739**	**8.5344**	**2.6374**	**2.0000**	**4.6374**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0777	0.0427	0.5869	1.6400e-003	0.1643	1.0400e-003	0.1653	0.0436	9.6000e-004	0.0445		163.7325	163.7325	4.0200e-003		163.8330
Total	**0.0777**	**0.0427**	**0.5869**	**1.6400e-003**	**0.1643**	**1.0400e-003**	**0.1653**	**0.0436**	**9.6000e-004**	**0.0445**		**163.7325**	**163.7325**	**4.0200e-003**		**163.8330**

3.3 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3605	0.0000	6.3605	2.6374	0.0000	2.6374			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3605**	**2.1739**	**8.5344**	**2.6374**	**2.0000**	**4.6374**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0777	0.0427	0.5869	1.6400e-003	0.1643	1.0400e-003	0.1653	0.0436	9.6000e-004	0.0445		163.7325	163.7325	4.0200e-003		163.8330
Total	**0.0777**	**0.0427**	**0.5869**	**1.6400e-003**	**0.1643**	**1.0400e-003**	**0.1653**	**0.0436**	**9.6000e-004**	**0.0445**		**163.7325**	**163.7325**	**4.0200e-003**		**163.8330**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3847	12.5369	2.2833	0.0316	0.7247	0.0550	0.7797	0.2087	0.0526	0.2612		3,302.2841	3,302.2841	0.1505		3,306.0471
Worker	1.1029	0.6064	8.3337	0.0233	2.3330	0.0148	2.3478	0.6188	0.0137	0.6325		2,325.0013	2,325.0013	0.0571		2,326.4288
Total	**1.4875**	**13.1433**	**10.6170**	**0.0549**	**3.0577**	**0.0698**	**3.1275**	**0.8275**	**0.0662**	**0.8937**		**5,627.2854**	**5,627.2854**	**0.2076**		**5,632.4759**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3847	12.5369	2.2833	0.0316	0.7247	0.0550	0.7797	0.2087	0.0526	0.2612		3,302.2841	3,302.2841	0.1505		3,306.0471
Worker	1.1029	0.6064	8.3337	0.0233	2.3330	0.0148	2.3478	0.6188	0.0137	0.6325		2,325.0013	2,325.0013	0.0571		2,326.4288
Total	**1.4875**	**13.1433**	**10.6170**	**0.0549**	**3.0577**	**0.0698**	**3.1275**	**0.8275**	**0.0662**	**0.8937**		**5,627.2854**	**5,627.2854**	**0.2076**		**5,632.4759**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3214	11.5342	2.0194	0.0313	0.7247	0.0262	0.7509	0.2086	0.0250	0.2337		3,276.4631	3,276.4631	0.1420		3,280.0129
Worker	1.0258	0.5434	7.6501	0.0225	2.3330	0.0144	2.3474	0.6188	0.0133	0.6321		2,243.1350	2,243.1350	0.0512		2,244.4138
Total	**1.3471**	**12.0776**	**9.6695**	**0.0538**	**3.0577**	**0.0406**	**3.0983**	**0.8275**	**0.0383**	**0.8658**		**5,519.5981**	**5,519.5981**	**0.1931**		**5,524.4267**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3214	11.5342	2.0194	0.0313	0.7247	0.0262	0.7509	0.2086	0.0250	0.2337		3,276.4631	3,276.4631	0.1420		3,280.0129
Worker	1.0258	0.5434	7.6501	0.0225	2.3330	0.0144	2.3474	0.6188	0.0133	0.6321		2,243.1350	2,243.1350	0.0512		2,244.4138
Total	**1.3471**	**12.0776**	**9.6695**	**0.0538**	**3.0577**	**0.0406**	**3.0983**	**0.8275**	**0.0383**	**0.8658**		**5,519.5981**	**5,519.5981**	**0.1931**		**5,524.4267**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	1.5248					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7804**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0542	0.0287	0.4041	1.1900e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		118.4754	118.4754	2.7000e-003		118.5430
Total	**0.0542**	**0.0287**	**0.4041**	**1.1900e-003**	**0.1232**	**7.6000e-004**	**0.1240**	**0.0327**	**7.0000e-004**	**0.0334**		**118.4754**	**118.4754**	**2.7000e-003**		**118.5430**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	1.5248					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7804**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0542	0.0287	0.4041	1.1900e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		118.4754	118.4754	2.7000e-003		118.5430
Total	**0.0542**	**0.0287**	**0.4041**	**1.1900e-003**	**0.1232**	**7.6000e-004**	**0.1240**	**0.0327**	**7.0000e-004**	**0.0334**		**118.4754**	**118.4754**	**2.7000e-003**		**118.5430**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	86.2597					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**86.4786**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2059	0.1091	1.5354	4.5200e-003	0.4682	2.9000e-003	0.4711	0.1242	2.6700e-003	0.1269		450.2067	450.2067	0.0103		450.4633
Total	**0.2059**	**0.1091**	**1.5354**	**4.5200e-003**	**0.4682**	**2.9000e-003**	**0.4711**	**0.1242**	**2.6700e-003**	**0.1269**		**450.2067**	**450.2067**	**0.0103**		**450.4633**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	86.2597					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**86.4786**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2059	0.1091	1.5354	4.5200e-003	0.4682	2.9000e-003	0.4711	0.1242	2.6700e-003	0.1269		450.2067	450.2067	0.0103		450.4633
Total	**0.2059**	**0.1091**	**1.5354**	**4.5200e-003**	**0.4682**	**2.9000e-003**	**0.4711**	**0.1242**	**2.6700e-003**	**0.1269**		**450.2067**	**450.2067**	**0.0103**		**450.4633**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	13.6880	65.2598	113.1545	0.3239	20.5887	0.4221	21.0108	5.5168	0.3995	5.9163		32,761.0862	32,761.0862	1.6796		32,803.0749
Unmitigated	13.6880	65.2598	113.1545	0.3239	20.5887	0.4221	21.0108	5.5168	0.3995	5.9163		32,761.0862	32,761.0862	1.6796		32,803.0749

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	203.35	198.45	169.40	566,607	566,607
General Office Building	275.75	61.50	26.25	500,653	500,653
High Turnover (Sit Down Restaurant)	1,271.50	1,583.70	1318.40	1,534,798	1,534,798
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	3,202.50	3,747.75	1893.00	5,423,535	5,423,535
Total	4,953.10	5,591.40	3,407.05	8,025,593	8,025,593

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	10.80	7.30	7.50	42.60	21.00	36.40	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
General Office Building	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
High Turnover (Sit Down Restaurant)	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
Parking Lot	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
Regional Shopping Center	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081
NaturalGas Unmitigated	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	1970.67	0.0213	0.1816	0.0773	1.1600e-003		0.0147	0.0147		0.0147	0.0147		231.8433	231.8433	4.4400e-003	4.2500e-003	233.2210
General Office Building	1127.4	0.0122	0.1105	0.0928	6.6000e-004		8.4000e-003	8.4000e-003		8.4000e-003	8.4000e-003		132.6350	132.6350	2.5400e-003	2.4300e-003	133.4232
High Turnover (Sit Down Restaurant)	2997.53	0.0323	0.2939	0.2469	1.7600e-003		0.0223	0.0223		0.0223	0.0223		352.6511	352.6511	6.7600e-003	6.4700e-003	354.7467
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2404.11	0.0259	0.2357	0.1980	1.4100e-003		0.0179	0.0179		0.0179	0.0179		282.8364	282.8364	5.4200e-003	5.1900e-003	284.5172
Total		**0.0917**	**0.8217**	**0.6150**	**4.9900e-003**		**0.0633**	**0.0633**		**0.0633**	**0.0633**		**999.9658**	**999.9658**	**0.0192**	**0.0183**	**1,005.9081**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	1.97067	0.0213	0.1816	0.0773	1.1600e-003		0.0147	0.0147		0.0147	0.0147		231.8433	231.8433	4.4400e-003	4.2500e-003	233.2210
General Office Building	1.1274	0.0122	0.1105	0.0928	6.6000e-004		8.4000e-003	8.4000e-003		8.4000e-003	8.4000e-003		132.6350	132.6350	2.5400e-003	2.4300e-003	133.4232
High Turnover (Sit Down Restaurant)	2.99753	0.0323	0.2939	0.2469	1.7600e-003		0.0223	0.0223		0.0223	0.0223		352.6511	352.6511	6.7600e-003	6.4700e-003	354.7467
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2.40411	0.0259	0.2357	0.1980	1.4100e-003		0.0179	0.0179		0.0179	0.0179		282.8364	282.8364	5.4200e-003	5.1900e-003	284.5172
Total		**0.0917**	**0.8217**	**0.6150**	**4.9900e-003**		**0.0633**	**0.0633**		**0.0633**	**0.0633**		**999.9658**	**999.9658**	**0.0192**	**0.0183**	**1,005.9081**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251
Unmitigated	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4727					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.2826					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	68.8678	1.3449	85.0098	0.1540		11.9192	11.9192		11.9192	11.9192	1,249.7279	524.1177	1,773.8455	1.1533	0.0983	1,831.9714
Landscaping	0.0888	0.0335	2.9063	1.5000e-004		0.0160	0.0160		0.0160	0.0160		5.2260	5.2260	5.1100e-003		5.3537
Total	**72.7119**	**1.3784**	**87.9161**	**0.1542**		**11.9352**	**11.9352**		**11.9352**	**11.9352**	**1,249.7279**	**529.3436**	**1,779.0715**	**1.1584**	**0.0983**	**1,837.3251**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4727					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.2826					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	68.8678	1.3449	85.0098	0.1540		11.9192	11.9192		11.9192	11.9192	1,249.7279	524.1177	1,773.8455	1.1533	0.0983	1,831.9714
Landscaping	0.0888	0.0335	2.9063	1.5000e-004		0.0160	0.0160		0.0160	0.0160		5.2260	5.2260	5.1100e-003		5.3537
Total	**72.7119**	**1.3784**	**87.9161**	**0.1542**		**11.9352**	**11.9352**		**11.9352**	**11.9352**	**1,249.7279**	**529.3436**	**1,779.0715**	**1.1584**	**0.0983**	**1,837.3251**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Loomis Costco No Project/Future Development Scenario

Placer-Sacramento County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	25.00	1000sqft	0.57	25,000.00	0
Parking Lot	11.28	Acre	11.28	491,356.80	0
High Turnover (Sit Down Restaurant)	10.00	1000sqft	0.23	10,000.00	0
Condo/Townhouse	35.00	Dwelling Unit	3.77	35,000.00	100
Regional Shopping Center	75.00	1000sqft	1.72	75,000.00	0
Other Asphalt Surfaces	0.36	Acre	0.36	15,681.60	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	2			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Alternative 1B conceptual no project/future development land use scenario. Other asphalt surfaces used to model off-site improvements project.

Construction Phase - Construction schedule and equipment based on CalEEMod defaults.

Vehicle Trips -

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix -

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	2.19	3.77

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.5252	50.2510	32.4840	0.0782	39.8936	2.1984	42.0920	21.8867	2.0225	23.9092	0.0000	7,814.4538	7,814.4538	1.9461	0.0000	7,835.5780
2021	86.6779	29.7264	25.8581	0.0772	3.0577	1.0005	4.0582	0.8275	0.9409	1.7683	0.0000	7,716.1375	7,716.1375	0.8233	0.0000	7,736.7204
Maximum	**86.6779**	**50.2510**	**32.4840**	**0.0782**	**39.8936**	**2.1984**	**42.0920**	**21.8867**	**2.0225**	**23.9092**	**0.0000**	**7,814.4538**	**7,814.4538**	**1.9461**	**0.0000**	**7,835.5780**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.5252	50.2510	32.4840	0.0782	39.8936	2.1984	42.0920	21.8867	2.0225	23.9092	0.0000	7,814.4538	7,814.4538	1.9461	0.0000	7,835.5780
2021	86.6779	29.7264	25.8581	0.0772	3.0577	1.0005	4.0582	0.8275	0.9409	1.7683	0.0000	7,716.1375	7,716.1375	0.8233	0.0000	7,736.7204
Maximum	**86.6779**	**50.2510**	**32.4840**	**0.0782**	**39.8936**	**2.1984**	**42.0920**	**21.8867**	**2.0225**	**23.9092**	**0.0000**	**7,814.4538**	**7,814.4538**	**1.9461**	**0.0000**	**7,835.5780**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251
Energy	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081
Mobile	11.0122	67.7322	117.9420	0.2969	20.5887	0.4321	21.0208	5.5168	0.4091	5.9259		30,022.4588	30,022.4588	1.7912		30,067.2398
Total	**83.8158**	**69.9324**	**206.4730**	**0.4560**	**20.5887**	**12.4306**	**33.0193**	**5.5168**	**12.4076**	**17.9244**	**1,249.7279**	**31,551.7682**	**32,801.4960**	**2.9688**	**0.1166**	**32,910.4729**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251
Energy	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081
Mobile	11.0122	67.7322	117.9420	0.2969	20.5887	0.4321	21.0208	5.5168	0.4091	5.9259		30,022.4588	30,022.4588	1.7912		30,067.2398
Total	**83.8158**	**69.9324**	**206.4730**	**0.4560**	**20.5887**	**12.4306**	**33.0193**	**5.5168**	**12.4076**	**17.9244**	**1,249.7279**	**31,551.7682**	**32,801.4960**	**2.9688**	**0.1166**	**32,910.4729**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2020	1/14/2020	5	10	
2	Grading	Grading	1/15/2020	2/25/2020	5	30	
3	Building Construction	Building Construction	2/26/2020	4/20/2021	5	300	
4	Paving	Paving	4/21/2021	5/18/2021	5	20	
5	Architectural Coating	Architectural Coating	5/19/2021	6/15/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 55

Acres of Paving: 11.64

Residential Indoor: 91,125; Residential Outdoor: 30,375; Non-Residential Indoor: 165,000; Non-Residential Outdoor: 55,000; Striped Parking Area: 30,710 (Architectural Coating – sqft)

OffRoad Equipment

Loomis Costco No Project/Future Development Scenario - Placer-Sacramento County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	284.00	107.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	57.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					39.7458	0.0000	39.7458	21.8475	0.0000	21.8475			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**39.7458**	**2.1974**	**41.9432**	**21.8475**	**2.0216**	**23.8691**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0676	0.0482	0.4732	1.3200e-003	0.1479	9.4000e-004	0.1488	0.0392	8.7000e-004	0.0401		131.1885	131.1885	3.2900e-003		131.2707
Total	**0.0676**	**0.0482**	**0.4732**	**1.3200e-003**	**0.1479**	**9.4000e-004**	**0.1488**	**0.0392**	**8.7000e-004**	**0.0401**		**131.1885**	**131.1885**	**3.2900e-003**		**131.2707**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					39.7458	0.0000	39.7458	21.8475	0.0000	21.8475			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**39.7458**	**2.1974**	**41.9432**	**21.8475**	**2.0216**	**23.8691**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0676	0.0482	0.4732	1.3200e-003	0.1479	9.4000e-004	0.1488	0.0392	8.7000e-004	0.0401		131.1885	131.1885	3.2900e-003		131.2707
Total	**0.0676**	**0.0482**	**0.4732**	**1.3200e-003**	**0.1479**	**9.4000e-004**	**0.1488**	**0.0392**	**8.7000e-004**	**0.0401**		**131.1885**	**131.1885**	**3.2900e-003**		**131.2707**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3605	0.0000	6.3605	2.6374	0.0000	2.6374			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3605**	**2.1739**	**8.5344**	**2.6374**	**2.0000**	**4.6374**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0751	0.0535	0.5257	1.4600e-003	0.1643	1.0400e-003	0.1653	0.0436	9.6000e-004	0.0445		145.7650	145.7650	3.6500e-003		145.8563
Total	**0.0751**	**0.0535**	**0.5257**	**1.4600e-003**	**0.1643**	**1.0400e-003**	**0.1653**	**0.0436**	**9.6000e-004**	**0.0445**		**145.7650**	**145.7650**	**3.6500e-003**		**145.8563**

3.3 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3605	0.0000	6.3605	2.6374	0.0000	2.6374			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**6.3605**	**2.1739**	**8.5344**	**2.6374**	**2.0000**	**4.6374**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0751	0.0535	0.5257	1.4600e-003	0.1643	1.0400e-003	0.1653	0.0436	9.6000e-004	0.0445		145.7650	145.7650	3.6500e-003		145.8563
Total	**0.0751**	**0.0535**	**0.5257**	**1.4600e-003**	**0.1643**	**1.0400e-003**	**0.1653**	**0.0436**	**9.6000e-004**	**0.0445**		**145.7650**	**145.7650**	**3.6500e-003**		**145.8563**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4077	12.6668	2.7682	0.0305	0.7247	0.0565	0.7812	0.2087	0.0540	0.2627		3,191.5285	3,191.5285	0.1702		3,195.7838
Worker	1.0666	0.7599	7.4654	0.0208	2.3330	0.0148	2.3478	0.6188	0.0137	0.6325		2,069.8623	2,069.8623	0.0519		2,071.1598
Total	**1.4743**	**13.4266**	**10.2336**	**0.0513**	**3.0577**	**0.0713**	**3.1290**	**0.8275**	**0.0677**	**0.8951**		**5,261.3908**	**5,261.3908**	**0.2221**		**5,266.9436**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4077	12.6668	2.7682	0.0305	0.7247	0.0565	0.7812	0.2087	0.0540	0.2627		3,191.5285	3,191.5285	0.1702		3,195.7838
Worker	1.0666	0.7599	7.4654	0.0208	2.3330	0.0148	2.3478	0.6188	0.0137	0.6325		2,069.8623	2,069.8623	0.0519		2,071.1598
Total	**1.4743**	**13.4266**	**10.2336**	**0.0513**	**3.0577**	**0.0713**	**3.1290**	**0.8275**	**0.0677**	**0.8951**		**5,261.3908**	**5,261.3908**	**0.2221**		**5,266.9436**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3428	11.6137	2.4692	0.0303	0.7247	0.0275	0.7522	0.2086	0.0263	0.2349		3,165.7171	3,165.7171	0.1610		3,169.7415
Worker	0.9931	0.6806	6.8137	0.0200	2.3330	0.0144	2.3474	0.6188	0.0133	0.6321		1,997.0565	1,997.0565	0.0463		1,998.2147
Total	**1.3358**	**12.2943**	**9.2829**	**0.0503**	**3.0577**	**0.0419**	**3.0996**	**0.8275**	**0.0396**	**0.8670**		**5,162.7736**	**5,162.7736**	**0.2073**		**5,167.9561**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3428	11.6137	2.4692	0.0303	0.7247	0.0275	0.7522	0.2086	0.0263	0.2349		3,165.7171	3,165.7171	0.1610		3,169.7415
Worker	0.9931	0.6806	6.8137	0.0200	2.3330	0.0144	2.3474	0.6188	0.0133	0.6321		1,997.0565	1,997.0565	0.0463		1,998.2147
Total	**1.3358**	**12.2943**	**9.2829**	**0.0503**	**3.0577**	**0.0419**	**3.0996**	**0.8275**	**0.0396**	**0.8670**		**5,162.7736**	**5,162.7736**	**0.2073**		**5,167.9561**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	1.5248					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7804**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0525	0.0360	0.3599	1.0600e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		105.4783	105.4783	2.4500e-003		105.5395
Total	**0.0525**	**0.0360**	**0.3599**	**1.0600e-003**	**0.1232**	**7.6000e-004**	**0.1240**	**0.0327**	**7.0000e-004**	**0.0334**		**105.4783**	**105.4783**	**2.4500e-003**		**105.5395**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	1.5248					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7804**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0525	0.0360	0.3599	1.0600e-003	0.1232	7.6000e-004	0.1240	0.0327	7.0000e-004	0.0334		105.4783	105.4783	2.4500e-003		105.5395
Total	**0.0525**	**0.0360**	**0.3599**	**1.0600e-003**	**0.1232**	**7.6000e-004**	**0.1240**	**0.0327**	**7.0000e-004**	**0.0334**		**105.4783**	**105.4783**	**2.4500e-003**		**105.5395**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	86.2597					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**86.4786**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1993	0.1366	1.3675	4.0200e-003	0.4682	2.9000e-003	0.4711	0.1242	2.6700e-003	0.1269		400.8177	400.8177	9.3000e-003		401.0501
Total	**0.1993**	**0.1366**	**1.3675**	**4.0200e-003**	**0.4682**	**2.9000e-003**	**0.4711**	**0.1242**	**2.6700e-003**	**0.1269**		**400.8177**	**400.8177**	**9.3000e-003**		**401.0501**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	86.2597					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**86.4786**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1993	0.1366	1.3675	4.0200e-003	0.4682	2.9000e-003	0.4711	0.1242	2.6700e-003	0.1269		400.8177	400.8177	9.3000e-003		401.0501
Total	**0.1993**	**0.1366**	**1.3675**	**4.0200e-003**	**0.4682**	**2.9000e-003**	**0.4711**	**0.1242**	**2.6700e-003**	**0.1269**		**400.8177**	**400.8177**	**9.3000e-003**		**401.0501**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	11.0122	67.7322	117.9420	0.2969	20.5887	0.4321	21.0208	5.5168	0.4091	5.9259		30,022.4588	30,022.4588	1.7912		30,067.2398
Unmitigated	11.0122	67.7322	117.9420	0.2969	20.5887	0.4321	21.0208	5.5168	0.4091	5.9259		30,022.4588	30,022.4588	1.7912		30,067.2398

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	203.35	198.45	169.40	566,607	566,607
General Office Building	275.75	61.50	26.25	500,653	500,653
High Turnover (Sit Down Restaurant)	1,271.50	1,583.70	1318.40	1,534,798	1,534,798
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	3,202.50	3,747.75	1893.00	5,423,535	5,423,535
Total	4,953.10	5,591.40	3,407.05	8,025,593	8,025,593

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	10.80	7.30	7.50	42.60	21.00	36.40	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Condo/Townhouse	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
General Office Building	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
High Turnover (Sit Down Restaurant)	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
Parking Lot	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565
Regional Shopping Center	0.476697	0.043889	0.220176	0.142419	0.030478	0.007289	0.024295	0.043166	0.001518	0.001285	0.006419	0.000804	0.001565

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081
NaturalGas Unmitigated	0.0917	0.8217	0.6150	5.0000e-003		0.0633	0.0633		0.0633	0.0633		999.9658	999.9658	0.0192	0.0183	1,005.9081

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	1970.67	0.0213	0.1816	0.0773	1.1600e-003		0.0147	0.0147		0.0147	0.0147		231.8433	231.8433	4.4400e-003	4.2500e-003	233.2210
General Office Building	1127.4	0.0122	0.1105	0.0928	6.6000e-004		8.4000e-003	8.4000e-003		8.4000e-003	8.4000e-003		132.6350	132.6350	2.5400e-003	2.4300e-003	133.4232
High Turnover (Sit Down Restaurant)	2997.53	0.0323	0.2939	0.2469	1.7600e-003		0.0223	0.0223		0.0223	0.0223		352.6511	352.6511	6.7600e-003	6.4700e-003	354.7467
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2404.11	0.0259	0.2357	0.1980	1.4100e-003		0.0179	0.0179		0.0179	0.0179		282.8364	282.8364	5.4200e-003	5.1900e-003	284.5172
Total		**0.0917**	**0.8217**	**0.6150**	**4.9900e-003**		**0.0633**	**0.0633**		**0.0633**	**0.0633**		**999.9658**	**999.9658**	**0.0192**	**0.0183**	**1,005.9081**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	1.97067	0.0213	0.1816	0.0773	1.1600e-003		0.0147	0.0147		0.0147	0.0147		231.8433	231.8433	4.4400e-003	4.2500e-003	233.2210
General Office Building	1.1274	0.0122	0.1105	0.0928	6.6000e-004		8.4000e-003	8.4000e-003		8.4000e-003	8.4000e-003		132.6350	132.6350	2.5400e-003	2.4300e-003	133.4232
High Turnover (Sit Down Restaurant)	2.99753	0.0323	0.2939	0.2469	1.7600e-003		0.0223	0.0223		0.0223	0.0223		352.6511	352.6511	6.7600e-003	6.4700e-003	354.7467
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	2.40411	0.0259	0.2357	0.1980	1.4100e-003		0.0179	0.0179		0.0179	0.0179		282.8364	282.8364	5.4200e-003	5.1900e-003	284.5172
Total		**0.0917**	**0.8217**	**0.6150**	**4.9900e-003**		**0.0633**	**0.0633**		**0.0633**	**0.0633**		**999.9658**	**999.9658**	**0.0192**	**0.0183**	**1,005.9081**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251
Unmitigated	72.7119	1.3784	87.9161	0.1542		11.9352	11.9352		11.9352	11.9352	1,249.7279	529.3436	1,779.0715	1.1584	0.0983	1,837.3251

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4727					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.2826					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	68.8678	1.3449	85.0098	0.1540		11.9192	11.9192		11.9192	11.9192	1,249.7279	524.1177	1,773.8455	1.1533	0.0983	1,831.9714
Landscaping	0.0888	0.0335	2.9063	1.5000e-004		0.0160	0.0160		0.0160	0.0160		5.2260	5.2260	5.1100e-003		5.3537
Total	**72.7119**	**1.3784**	**87.9161**	**0.1542**		**11.9352**	**11.9352**		**11.9352**	**11.9352**	**1,249.7279**	**529.3436**	**1,779.0715**	**1.1584**	**0.0983**	**1,837.3251**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.4727					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.2826					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	68.8678	1.3449	85.0098	0.1540		11.9192	11.9192		11.9192	11.9192	1,249.7279	524.1177	1,773.8455	1.1533	0.0983	1,831.9714
Landscaping	0.0888	0.0335	2.9063	1.5000e-004		0.0160	0.0160		0.0160	0.0160		5.2260	5.2260	5.1100e-003		5.3537
Total	**72.7119**	**1.3784**	**87.9161**	**0.1542**		**11.9352**	**11.9352**		**11.9352**	**11.9352**	**1,249.7279**	**529.3436**	**1,779.0715**	**1.1584**	**0.0983**	**1,837.3251**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Draft Health Risk Assessment

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Memorandum

Loomis Costco Project
AECOM – Draft Health Risk Assessment

AECOM has prepared this summary to describe the results of the Health Risk Assessment (HRA) for the proposed Costco warehouse retail store and fueling station project, referred to as the project. The HRA has been requested by the Placer County Air Pollution Control District (PCAPCD), for compliance with the California Environmental Quality Act (CEQA), and is consistent with the 1997 Toxics Committee of the California Air Pollution Control Officers Association (CAPCOA). This memorandum describes the proposed project, the approach to the health risk assessment (HRA), and the modeling methodologies used to perform the analysis.

This memorandum addresses the following topics, as listed below by section:

1.0 – Introduction describes the project understanding and the objectives and methodology for the HRA.

2.0 – Emissions Estimates describes the methods used to estimate the emissions of toxic air contaminants (TACs) generated from project construction and operations.

3.0 – Air Dispersion Modeling describes the methods for modeling pollutant dispersion and estimating pollutant concentration contributions from project sources.

4.0 – Health Risk Analysis Methodology provides an overview of the methodology for estimating potential health risks to defined sensitive receptors.

5.0 – Health Risk Analysis Results provides the results of the project cancer risk at the defined sensitive receptors.

6.0 – Cumulative Health Risk provides a discussion of the cumulative risk due to the project and nearby sources.

7.0 – Uncertainties provides a discussion of uncertainties and limitations associated with the Health Risk Analysis.

8.0 – References provides the sources cited in this memorandum.

1.0 Introduction

Project Understanding

The project applicant, Costco Wholesale, proposes to develop the 17.4 acre property located at in the town of Loomis, in Placer County, approximately 25 miles northeast of the city of Sacramento. More specifically, the proposed project site is located at the southeast corner of the Sierra College Boulevard/Brace Road intersection. The proposed project is a warehouse retail store with a fueling station.

The warehouse retail site would sell national brands and private-label merchandise for commercial and personal use. Other goods and services provided would include tire sales and installation, sales of motor vehicle fuel including diesel, optical exams and sales, a photo center and processing, hearing aid testing and sales, food service preparation and sales (including meat and baked goods), alcohol sales and tasting, and propane tank exchanges. During seasonal sales promotions, temporary outdoor sales may occur within the parking field adjacent to the warehouse.

Costco is a membership-only retail/wholesale business. Warehouse and tire center hours are anticipated to be Monday through Friday from 10 a.m. to 8:30 p.m., Saturday from 9:30 a.m. to 6 p.m., and Sunday from 10 a.m. to 6 p.m. The fueling facility is anticipated to operate daily from 5 a.m. to 10 p.m.

The proposed warehouse retail space would be constructed using a steel frame, masonry blocks, and metal paneling supported by a concrete slab on-grade foundation. The warehouse structure would be approximately 33 feet tall and would provide 155,000 square feet of floor space dedicated to retail goods and services. The warehouse would be located near the northern boundary of the project site, while the fueling station would be located on the southwest corner of the site, as shown in **Figure 1**.

The loading dock for the Costco warehouse would be located on the southwest side of the warehouse, away from residential uses located north and east of the project site. A smaller on-grade door would be located on the west side of the building to receive smaller deliveries such as baked goods and other shipments.

The fueling station would be located in the southwest corner of the project site, adjacent to Sierra College Boulevard. The station would include a 7,560-square-foot canopy and a 106-square-foot controller enclosure that would be located on the southern portion of the station's landscape planter. The enclosure's walls would be constructed of steel and painted in earth tones to match the warehouse.

There are three slightly different configuration scenarios being considered for the project, which only affect secondary vehicle entrance points. The three scenarios include the following variations;

- Option A – has a second entrance/exit driveway along Brace Road near the northeast corner of the project site;
- Option B – does not have a second entrance/exit driveway along Brace Road but does have an entrance/exit connection from the southern portion of project site to Granite Drive; anOption C – same as Option A and includes the entrance/exit connection to Granite Drive.

All 3 options will be assessed as part of this HRA.

Project Construction

Construction for the proposed project is anticipated to occur over a six month period. Grading and site preparation would take 2 months to complete. Utility installation, paving, and erection of the structure would follow over a 2-month time frame. Construction would conclude with the application of architectural coatings and installation of landscaping during a 1-month period.

Preparation for construction would begin with the demolition of existing building foundations and grubbing to remove vegetation. Abandoned utilities in the proposed development areas, including a domestic well and other existing features (if encountered), would be removed and the excavation(s) would be backfilled with engineered fill. Debris produced during demolition (e.g., wood, steel, piping, and plastics) would be separated and disposed of off-site. Existing utility pipelines or conduits would be abandoned in place and plugged with nonshrinking cement grout to prevent migration of soil and/or water.

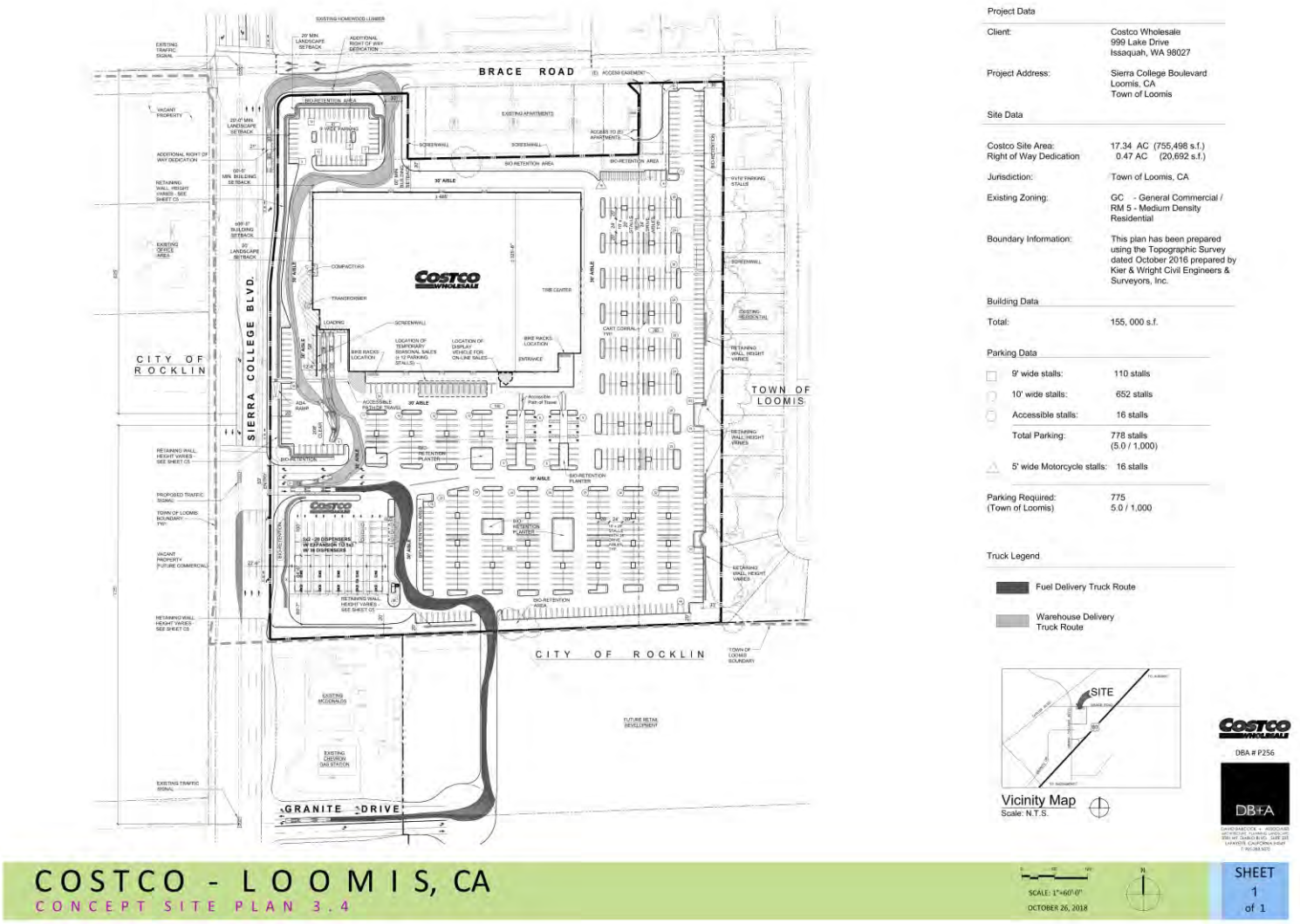
Once this work has been completed, soil on portions of the property would be overexcavated and recompacted to reduce the potential for differential settlement and provide uniform support for the proposed warehouse and associated facilities. According to the preliminary grading plan (Figure 2-9), the finished floor elevation for the warehouse would be approximately 331.50 feet above mean sea level. The warehouse building pad area would be raised as much as approximately 10 feet by fill and would transition to an area of cut as deep as 5 feet. The fueling facility area would be raised approximately 1–5 feet above the existing ground surface. Excavations for deep utilities and the loading dock may exceed 4 feet, and installing the underground storage tanks for the fueling facility would require excavation up to about 20 feet deep.Earthwork would be balanced on-site, with the earth material cut during overexcavation used as fill to establish building pads. No import or export of soil would be necessary to construct the project. Staging and materials storage would occur on the project site.

Project Operation

The proposed project anticipates up to 13 diesel engine trucks delivering goods on a daily basis to the warehouse retail store. The loading bays are planned to be located in the southwest portion of the warehouse, which would be the farthest point of the warehouse from residences. It is anticipated that on average, four of the 13 trucks per day would be equipped with diesel engines powering transport refrigeration units (TRUs). Additional on-site off-road equipment used during project operations, such as forklifts will be battery operated and therefore do not pose an air quality health risk are not included as part of this HRA. No diesel generators are planned to be used as part of this project.

The fueling station would contain four covered fueling bays, each with three two-sided fuel dispensers that would allow up to six vehicles to occupy each island. The station would also have eight stacking lanes, which would allow approximately 32 vehicles to queue for the pumps at any given time. The station would initially have fueling capacity for 24 fuel positions (i.e. dispensers), with the potential to expand to 30 fuel positions as demand warrants. This HRA assumes the maximum anticipated number of fuel dispensers to be 30, which would allow for approximately 30 vehicles to queue for the pumps at any given time. Fuel would be stored in three underground tanks installed along the perimeter of the station. The fueling station is planned for the southwest corner of the project site along Sierra College Boulevard. The proposed project anticipates an average of seven gasoline fuel delivery trucks on a daily basis to the refueling station.

Figure 1: Site Plan



Health Risk Background

The U.S. Environmental Protection Agency (USEPA) regulates hazardous air pollutants (HAPs), also known as toxic air contaminants or TACs. TACs may be emitted by stationary, area, or mobile sources. Common stationary sources of TAC emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to the requirements of local air districts' permits. The other, often more substantial, sources of TAC emissions are motor vehicles on freeways, on high-volume roadways, or in other areas with high numbers of diesel vehicles, such as distribution centers. Off-road mobile sources are also major contributors of TAC emissions and include construction equipment, ships, and trains.

TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., long-duration) and acute (i.e., severe but short-term) adverse effects on human health, including carcinogenic effects. Human health effects of TACs include birth defects, neurological damage, cancer, and mortality. There are hundreds of different types of TACs with varying degrees of toxicity. The health risks of individual TACs vary greatly; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs can be separated into carcinogens and noncarcinogens based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur. Any exposure to a carcinogen poses some risk of contracting cancer. Noncarcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

Air pollution does not affect every individual in the population in the same way, and some groups are more sensitive than others to adverse health effects. Land uses such as residences, schools, daycare centers, hospitals, and nursing and convalescent homes are considered most sensitive to poor air quality because the population groups associated with these uses are more susceptible to respiratory distress or, for residential receptors, their exposure time is greater than that for other land uses. Therefore, these groups are referred to as sensitive receptors.

The project site is located in approximately 35 kilometers northeast Sacramento in the Placer County Air Pollution Control District (PCAPCD). The project site is adjacent to residential and commercial buildings. Multi-family dwelling units are located north of the project site with single-family homes located to the east of the project site. The nearest sensitive receptors are within the multi-family units to the north (situated south of Brace Road, between Starlight Lane and Sierra College Boulevard) and single-family homes to the east (along Hunters Drive), both located approximately 50 feet from of the project site boundary.

Objective and Methodology

The purpose of this HRA is to assess potential TAC emission impacts associated with daily operation of the proposed project. PCAPCD has requested that the HRA be prepared as part of the response to comments on the Draft Environmental Impact Report (DEIR) to determine the potential risk on the exposure of sensitive receptors to toxic air contaminants (TACs) emission from the fueling station and other operational sources with TAC emissions. Analyses were conducted consistent with guidance and methodologies from local, regional, state, and federal agencies, including CAPCOA (2009), the California Air Resources Board (ARB) (2017), the Office of Environmental Health Hazard Assessment (OEHHA) (2015), and the U.S. Environmental Protection Agency (EPA) (2017).

Consistent with CEQA requirements and guidance provided by CAPCOA, the analysis evaluated the following:

1. *Health risk and hazard impacts of operational emissions* from the project-related construction and operational emissions on existing and future off-site sensitive receptors (residents and schools) located within 2 kilometers of the project site. **Figures 2 and 3** show the locations of receptors included in the modeling for the proposed project for the far and near fields, respectively.

The results are summarized in Section 5.

Project Sources

This HRA evaluates the following sources of air quality emissions and exposures:

1. **Construction Emissions:** The proposed project's construction-related emissions affecting local sensitive receptors. Emissions sources include construction equipment and vehicle trips.

2. **Operational Emissions from Truck Deliveries**: The proposed project operational emissions associated with trucks traveling to and from the site (within ¼ mile) and idling during loading/unloading activities affecting local sensitive receptors. Emission sources include diesel engine exhaust from trucks while idling and exhaust from diesel engines powering trailer refrigeration units (TRUs).

3. **Operational Emissions from Gasoline Deliveries**: The proposed project operational emissions associated with gasoline fuel trucks traveling within ¼ mile of the site and idling at the loading dock. The ¼ mile extent is comparable or slightly more conservative with other California air district guidance, such as the Bay Area Air Quality Management District (BAAQMD) (2017) that recommends 1,000 feet from project boundary or within.

4. **Operational Emissions from New Customer Vehicle Trips**: The proposed project operational emissions associated with new vehicle traffic from customer vehicles traveling within ¼ mile of the site. Emissions associated with customer vehicles in queue (up to 30 simultaneously during the peak hour) are included.

5. **Operations Emissions from Refueling Station**: The proposed project operational emissions associated with loading, storage, and spillage of gasoline and refueling of vehicles affecting local sensitive receptors. There will be no diesel or propane dispensers at the fueling station. Emission sources from a refueling station according to CAPCOA guidance include:

    a. **Bulk Transfer Losses (Loading)** – emissions that occur when a cargo tank truck unloads gasoline to the storage tanks at the gasoline station. Storage tank vapors are emitted from the vent pipe during the initial transfer period.

    b. **Pressure Driven Losses (Breathing)** – gasoline vapors emitted from the storage tank vent pipe due to temperature and pressure changes within the storage tank vapor space.

    c. **Fueling and Hose Permeation**– gasoline vapors that are emitted during the refueling process at the vehicle/nozzle interface.

    d. **Spillage** – emissions that occur from spills during vehicle fueling.

Figure 2: Receptors within 2 kilometers of the Proposed Project

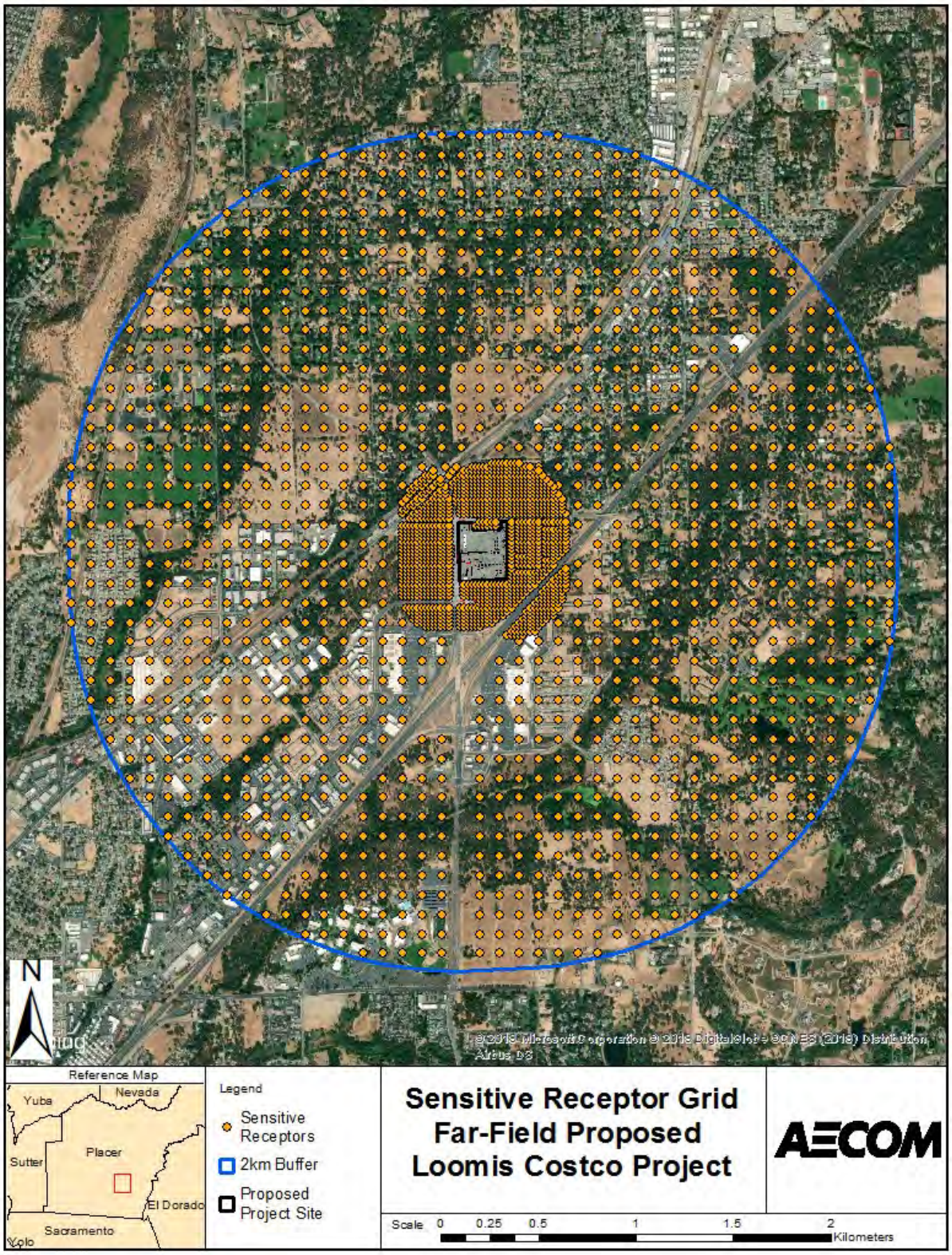
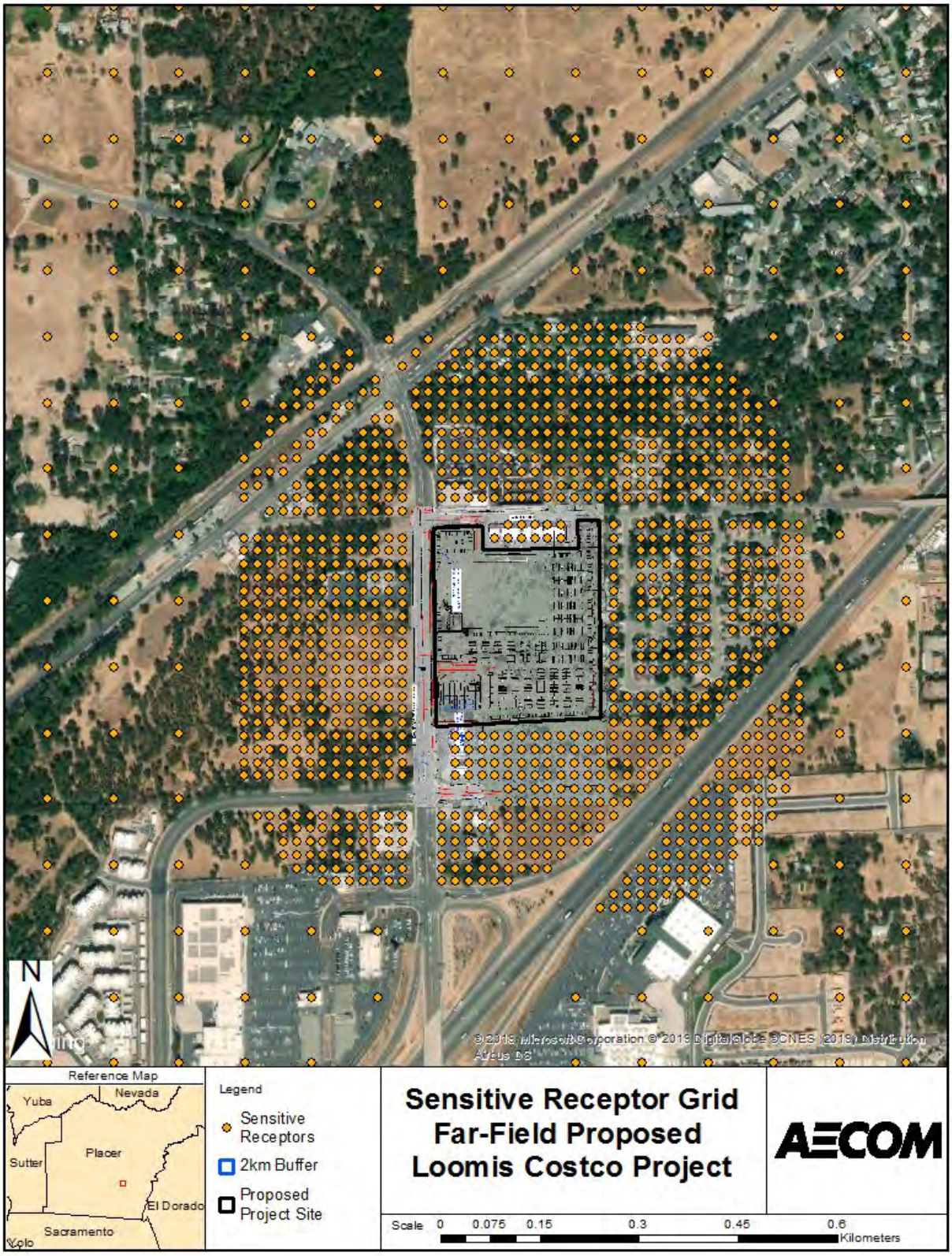


Figure 3: Near-Field View of Receptors around the Proposed Project



2.0 Emissions Estimates

This HRA evaluates diesel particulate matter (DPM) (assumed to be equivalent to $PM_{2.5}$ exhaust) from delivery trucks and components of gasoline (benzene, toluene, xylenes and methyl tertiary-butyl either (MTBE)) associated with operation of the gas station. These emissions estimates are then used to determine concentrations of each pollutant at sensitive receptor locations in order to evaluate the excess cancer risk a receptor is exposed to as a result of the proposed project. This section identifies the methodologies used to estimate pollutant emissions.

The proposed project construction and operational air quality emissions were quantified according to guidance and methods from CAPCOA, ARB, and EPA as previously referenced above. The process for determining the parameters and assumptions used to model these emissions, along with the modeling methods, are described below. Attachment A of the Criteria Air Pollutant Analysis (CAPA) contains the detailed emissions output and a summary of the emissions used in this analysis is provided in **Attachment A** of this document.

Calculation Methodologies for Construction Emission Sources

Construction of the proposed project would generate emissions of TACs (i.e., diesel particulate matter) from a variety of sources, including off-road construction equipment, on-road vehicles, earthmoving activities, architectural coating activities, and paving activities. Construction emissions are dependent on the following project information:

- Schedule and duration of construction phases
- Types and sizes (site acreages and building square footages) of land uses to be developed

The following list of construction activities used CalEEMod defaults to estimate the emissions since project-specific information was not provided. The default parameters used are detailed in **Attachment A**, but include the following:

- Off-road construction equipment and activity schedules
- Construction-related haul-truck traffic volumes
- Construction worker traffic volumes
- Earthmoving activities (e.g., cut/fill, grading)

Construction of the project is estimated to take approximately six months to complete, with various activities occurring as described in Section 1. There are two proposed construction scenarios;

1. One that involves providing an access road that connects Granite Road with the southern portion of the project site (Options B and C), and
2. The other does not include this access road (Option A).

The equipment used in the construction of the project is described in the Criteria Air Pollutant Analysis (CAPA) contained in Attachment A. Construction emissions were calculated for each year and were converted from total tons/year to grams per second (g/s) for the $PM_{2.5}$ analysis and pounds per year (lb/year) for the excess cancer risk analysis for each construction phase. As discussed in Section 3 below, the g/s emissions assumed 1,846 hours during the six months of construction and as such the tons/year conversion was based on this number of hours/year. The tons/year to lb/year conversion is not time related.

Figures 4 and **5** show the location of the off- and on-road construction sources for each of the construction scenario options.

Off-Road Construction Equipment

Off-road construction equipment would generate exhaust-related emissions of TACs. To calculate emissions, the number and types of construction equipment required for each construction phase were identified, along with the hours of operation per day, horsepower, and the load factor for each respective piece of project-specific equipment. For those pieces of equipment that project-specific information was unavailable, CalEEMod default parameters were selected. Pursuant to BAAQMD's guidance, the California Emissions Estimator Model (CalEEMod) was used to estimate emissions resulting from off-road construction equipment.

CalEEMod contains emission factors from ARB's off-road equipment emissions estimator model, OFFROAD 2011. Both EPA and the State of California have set emissions standards for new off-road equipment engines, ranging from Tier 1 to Tier 4. Tier 1 emission standards were phased in between 1996 and 2000, and Tier 4 interim and final emission standards for all new engines were phased in between 2008 and 2015. The emission factors for the engines were based on the fleet average, which includes all tier engines for the calendar year of the analysis. Default assumptions for the equipment type, hours, horsepower and load factors are noted above contained in CalEEMod were used to quantify emissions. The CalEEMod default assumptions typically are conservative, providing a reasonable upper boundary for potential construction emissions. The analysis performed used CalEEMod Version 2016.3.2, which is the most current version of the CalEEMod. The CalEEMod outputs provide estimates of $PM_{2.5}$ emissions from diesel exhaust, brake wear, tire wear, and running losses. These emissions were conservatively assumed to equal DPM as well.

On-Road Construction Vehicles

On-road construction sources include construction-worker vehicles, material delivery trucks, and on-site work trucks. CalEEMod was used to estimate emissions resulting from these on-road vehicles. $PM_{2.5}$ exhaust emissions from DPM as well as reactive organic gas (ROG) emissions from gasoline exhaust are also estimated by CalEEMod. As noted above, $PM_{2.5}$ exhaust was assumed to be DPM. Default assumptions for parameters such as construction-worker vehicles and on-site work trucks, material delivery trips, construction worker trips, trip distance, and vehicle type were estimated using CalEEMod. The CalEEMod emissions were scaled by trip length within the modeling domain divided by CalEEMod trip distance to determine the amount of emissions within the modeling domain the project. In addition to estimating air pollution emissions using CalEEMod, emission factors from EMFAC2017 and OFFROAD2017 were used. As noted above, annual tons/year output from CalEEMod was converted to lb/year.

Table 1 summarizes the construction emissions used in the HRA.

TABLE 1
UNCONTROLLED CONSTRUCTION RELATED EMISSIONS (LB/YEAR)

Source	ROG	Exhaust $PM_{2.5}$
Off-Site (Mobile Vehicles)	52.34	4.10
On-Site (Off-Road Equip/Vehicles)	2,055.20	180.64

Notes: lb/year = pounds per year; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; ROG = reactive organic gases
Emissions shown are for Options B and C, which are identical and present the worst-case construction emissions scenario inclusive of additional improvements providing an access road that connects Granite Road with the southern portion of the project site.

Figure 4: TAC and Diesel Emission Source Locations Associated with Construction of Proposed Project Including Connection to Granite Road (Option B/C)

Figure 5: TAC and Diesel Emission Source Locations Associated with Construction of Proposed Project without a Connection to Granite Road (Option A)

Calculation Methodologies for Operational Emission Sources

After construction of the proposed project, long-term operations would generate emissions of TACs from a variety of sources, including stationary sources, volume sources, and mobile sources.

Operational emissions have been calculated for each of the proposed project scenarios. TACs will not be emitted from the warehouse as the equipment used inside the warehouse such as forklifts will be electric. The assumptions and methods used to conduct the calculations are summarized below.

Stationary Sources

CAPCOA guidance for Gasoline Service Stations (CAPCOA 1997) recommends that gas venting from loading and breathing processes be characterized in the model as point sources. It was assumed that for each gas pump (15 gas pumps that equates to 30 fuel positions) would be included as a single point source for each pump. **Figure 6** depicts the proposed location of the vent stack emissions due to loading and breathing. To account for emissions associated with fueling (refueling) and spillage processes, these sources were characterized as volume sources in the model, consistent with the CAPCOA guidance. **Figure 6** shows the proposed location of the volume sources that consider the length and width of typical vehicles. Emission factors and methods prescribed by CARB's Revised Emission Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities (ARB, 2013) were used to estimate emissions for the bulk transfer (loading) and pressure driven losses (breathing processes) for underground tanks. It was assumed that the annual gasoline throughput for the proposed project would be 20 million gallons per year. **Table 2** summarizes the ROG emission factors used in the modeling for these processes.

Idling truck emissions were calculated using diesel heavy duty truck idling emission factors taken from ARB's motor vehicle emission factor model, EMFAC 2017. Idling emission rates are provided in grams per vehicle per day and were converted to grams per vehicle per idle-hour using idle hours for selected categories provided in Table 4.4-9 of ARBs EMFAC 2017 Technical Documentation Volume III (ARB, 2018a). It is assumed that there will be nine trucks per day without TRUs, and four trucks per day that would include TRUs, for a total of 13 warehouse delivery trucks per day. Based on the annual gasoline throughput of 20,000,000 gallons per year and tanker truck capacity, approximately seven trucks per day will deliver gasoline to the gas station. This HRA assumes seven gasoline delivery trucks per day. Idling emission rates are in grams per hour, and emissions were estimated assuming each cargo delivery truck with or without TRUs would idle for up to 10 minutes (5 minutes upon arrival and 5 minutes prior to departure) and each gasoline delivery truck would idle up to 10 minutes (5 minutes upon arrival and 5 minutes prior to departure). In addition, emissions associated with the diesel-powered TRUs were estimated using emission rates from the ARB OFFROAD 2017 emissions inventory for a 25 horsepower Truck TRU. The TRU emission rates are provided in tons per day and were converted to grams per horsepower-hour to calculate daily emissions, which assumed each of the four TRUs on-site daily would operate for up to one hour.

TABLE 2
ROG EMISSION FACTORS FOR GASOLINE STATIONS

Current Emission Factors (lbs/1000 gal)[1]	Process
0.15	Bulk Transfer (Loading)
0.024	Pressure Driven Losses (Breathing)
0.09783[2,3]	Fueling and Hose Permeation (Refueling)
0.24	Spillage

[1] Emission factors obtained from table I-I in CARB's Revised Emission Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities (2013).
[2] Fueling is based upon 80% On-board Refueling Vapor Recovery (ORVR) and 20% non-ORVR vehicles obtained from Figure 1 from CARB's Staff Report: Initial Statement of Reasons (2018b)
[3]Hose permeation emissions added to fueling sources.

To account for emissions associated customer vehicles, these sources were characterized as volume sources in the model. **Figure 6** shows the proposed location of the volume sources (green lines) that consider the area where these vehicles would be waiting in queue to refuel. Emissions from the idling of passenger vehicles in queue at the fueling station were calculated using emission factors from EMFAC2017. Because EMFAC only provides extended idle emissions rates for heavy duty trucks, idle emissions for passenger vehicles were computed using the methods recommended by ARB for light-duty vehicles. Running emissions rates for the lowest speed bin (in this case, 10 miles per hour) for light- and medium-duty vehicles and converting these rates to hourly emissions. This analysis assumed that the peak hour would have up to 30 vehicles in queue constantly for a peak hour. Similar to traffic studies which often assume that peak hour is approximately 10 percent of daily volume, this relationship was assumed for the queue line, thus assuming that the peak hour emissions from idling vehicles in queue at the fueling station represented 10 percent of the daily emissions from queuing.

Mobile Sources

Mobile-source emissions for worker and customer trips were calculated using vehicle miles traveled (VMT) from the TIS (Kittelson & Associates, 2019) and used CalEEMod. As described for construction on-road vehicles, CalEEMod Version 2016.3.2 incorporates EMFAC2014 mobile-source emission factors. On-road emissions from the cargo and fuel delivery trucks and the TRUs while in transit were calculated using EMFAC 2017 and OFFROAD 2017, respectively. **Figures 7** through **12** show the anticipated road routes of customer and worker traffic (for three configurations), warehouse, and gas deliveries (for two configurations), respectively. The CalEEMod emissions were scaled by trip length within the modeling domain divided by CalEEMod trip distance to determine the amount of emissions within modeling domain the project. **Table 3** summarizes the annual operational emissions used in the HRA. It is assumed that all new customer and worker mobile emissions are from gasoline vehicles, while diesel vehicles include delivery trucks to the warehouse and gasoline delivery trucks.

TABLE 3
UNCONTROLLED OPERATION RELATED EMISSIONS (LB/YEAR)

Source	ROG	Exhaust Diesel PM
Diesel Vehicles	--	24.36
Gasoline Vehicles	753.55	--
Notes: lb/year = pounds per year; $PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns; ROG = reactive organic gases		

Table 4 summarizes the gasoline station emission rates used in the HRA.

TABLE 4
GASOLINE STATION RELATED ROG EMISSIONS

Process	Benzene	Toluene	Xylenes	MTBE
Loading	9.00E+00	3.00E+01	3.00E+01	3.30E+02
Breathing	1.44E+00	4.80E+00	4.80E+00	5.28E+01
Refueling	5.97E+00	1.96E+01	1.96E+01	2.15E+02
Spillage	4.80E+01	3.84E+02	1.15E+02	5.28E+02
Totals	6.43E+01	4.38E+02	1.70E+02	1.13E+03
Notes: lb/year = pounds per year; Annual throughput assumes 20,000,000 gallons of gasoline per year.				

Figure 6: TAC and Diesel Emission Source Locations Associated with Proposed Project

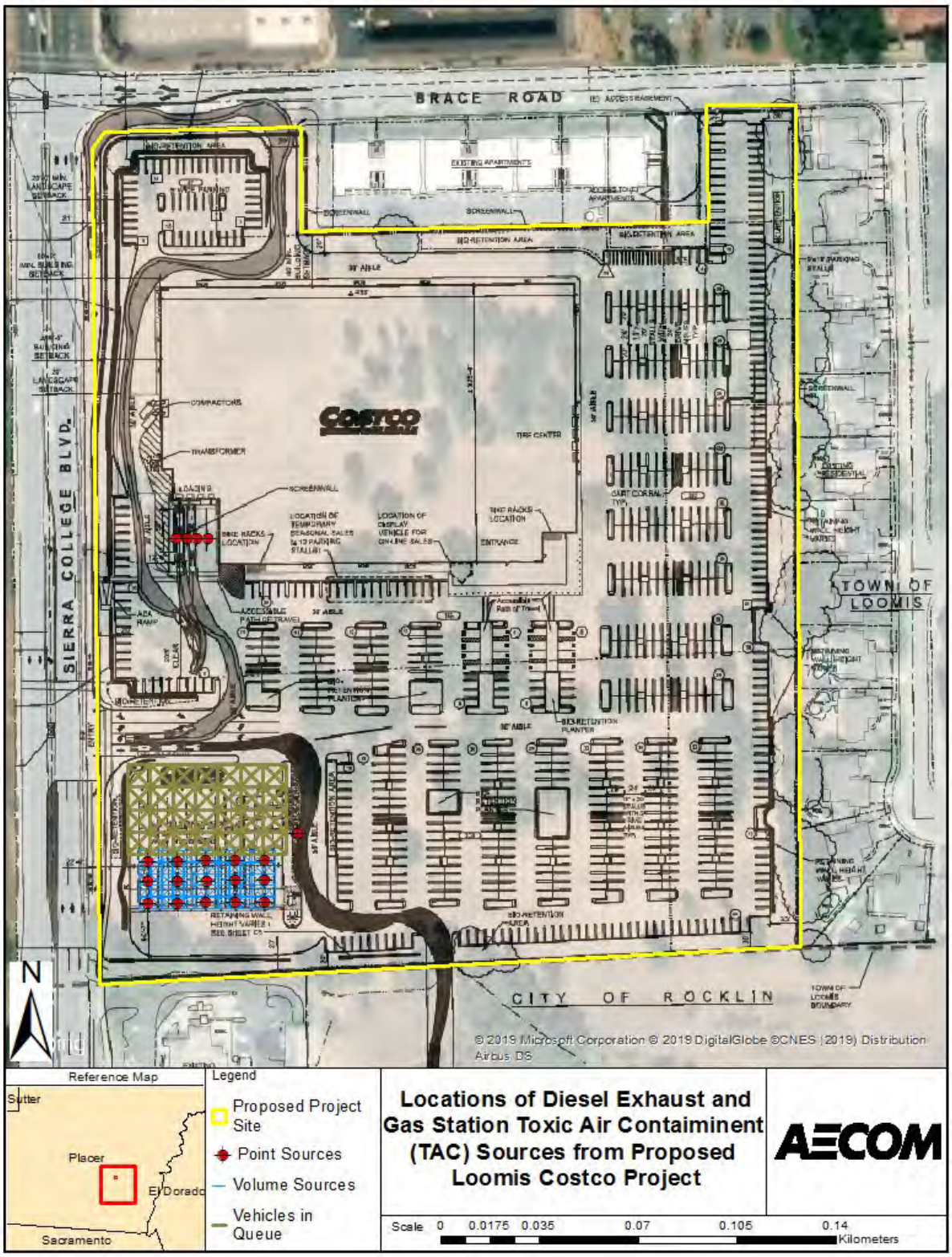


Figure 7: TAC and Diesel Emission Source Locations Associated with On-Road Customer and Worker Vehicles with the Proposed Project – Option A

Figure 8: TAC and Diesel Emission Source Locations Associated with On-Road Customer and Worker Vehicles with the Proposed Project – Option B

Figure 9: TAC and Diesel Emission Source Locations Associated with On-Road Customer and Worker Vehicles with the Proposed Project – Option C

Figure 10: TAC and Diesel Emission Source Locations Associated with On-Road Warehouse Delivery Vehicles with the Proposed Project – Options A, B and C

Figure 11: TAC and Diesel Emission Source Locations Associated with On-Road Gasoline Delivery Vehicles with the Proposed Project – Option A

Figure 12: TAC and Diesel Emission Source Locations Associated with On-Road Gasoline Delivery Vehicles with the Proposed Project – Options B and C

3.0 Air Dispersion Modeling

The American Meteorological Society/USEPA Regulatory Model (AERMOD) dispersion model (Version 19191) was used to estimate pollutant concentrations at specific distances from project emission sources using hourly meteorological data. At the direction of PCAPCD, the Sacramento International Airport meteorological station (2009-2014) of hourly meteorological data was used.

Meteorological Data

The topography around Loomis, CA is generally flat with some rolling hills to the south and a relatively large lake (Folsom Lake) to the southeast. More elevated terrain features are situated to the west, north and northeast of the area with several mountain passes to the northeast. A wind rose using near-surface (10-meter) wind measures from the Sacramento International Airport from 2009-2014 is shown in **Figure 13**. **Figure 14** shows the location of the Sacramento International Airport relative to the proposed project site.

Figure 13
Sacramento International Airport Wind Rose (2009-2014)

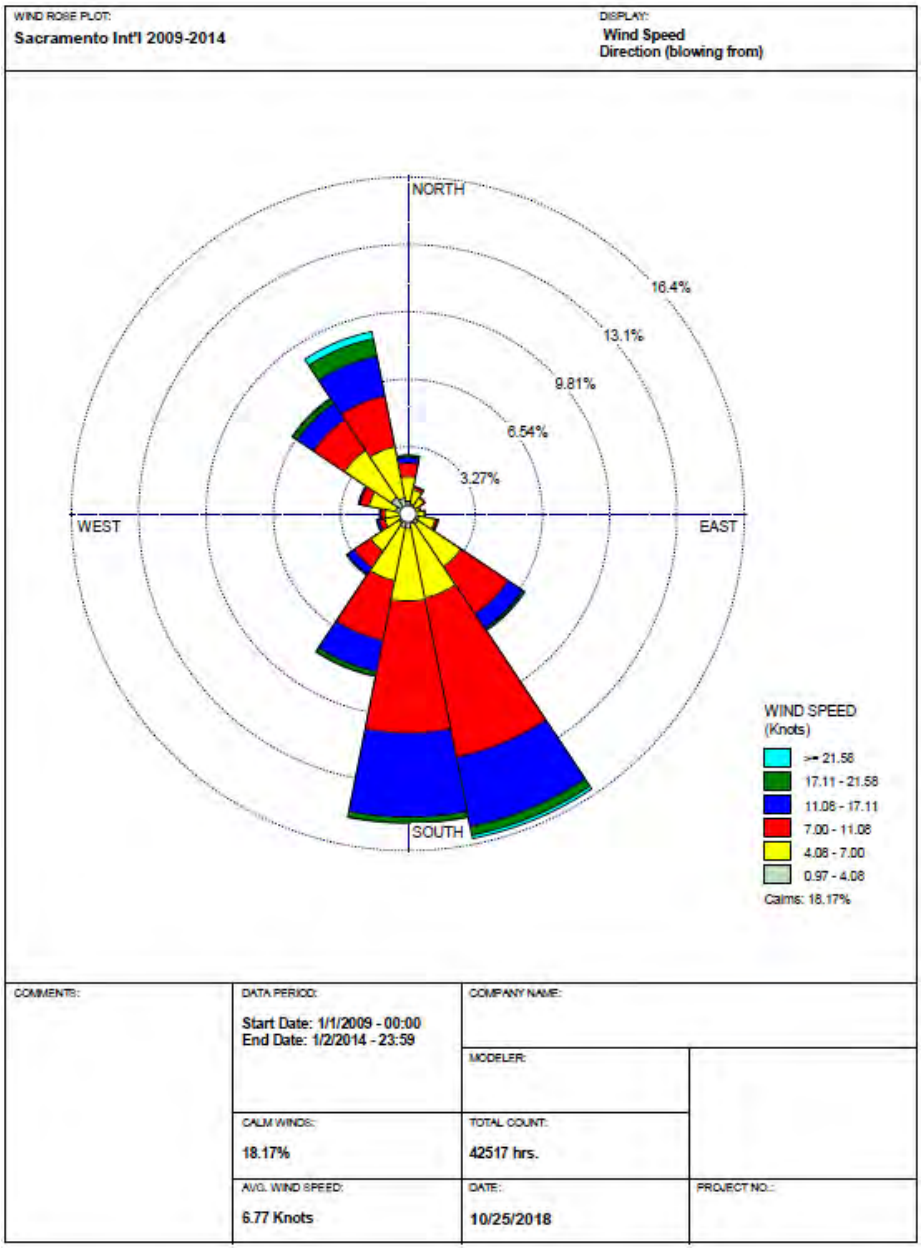
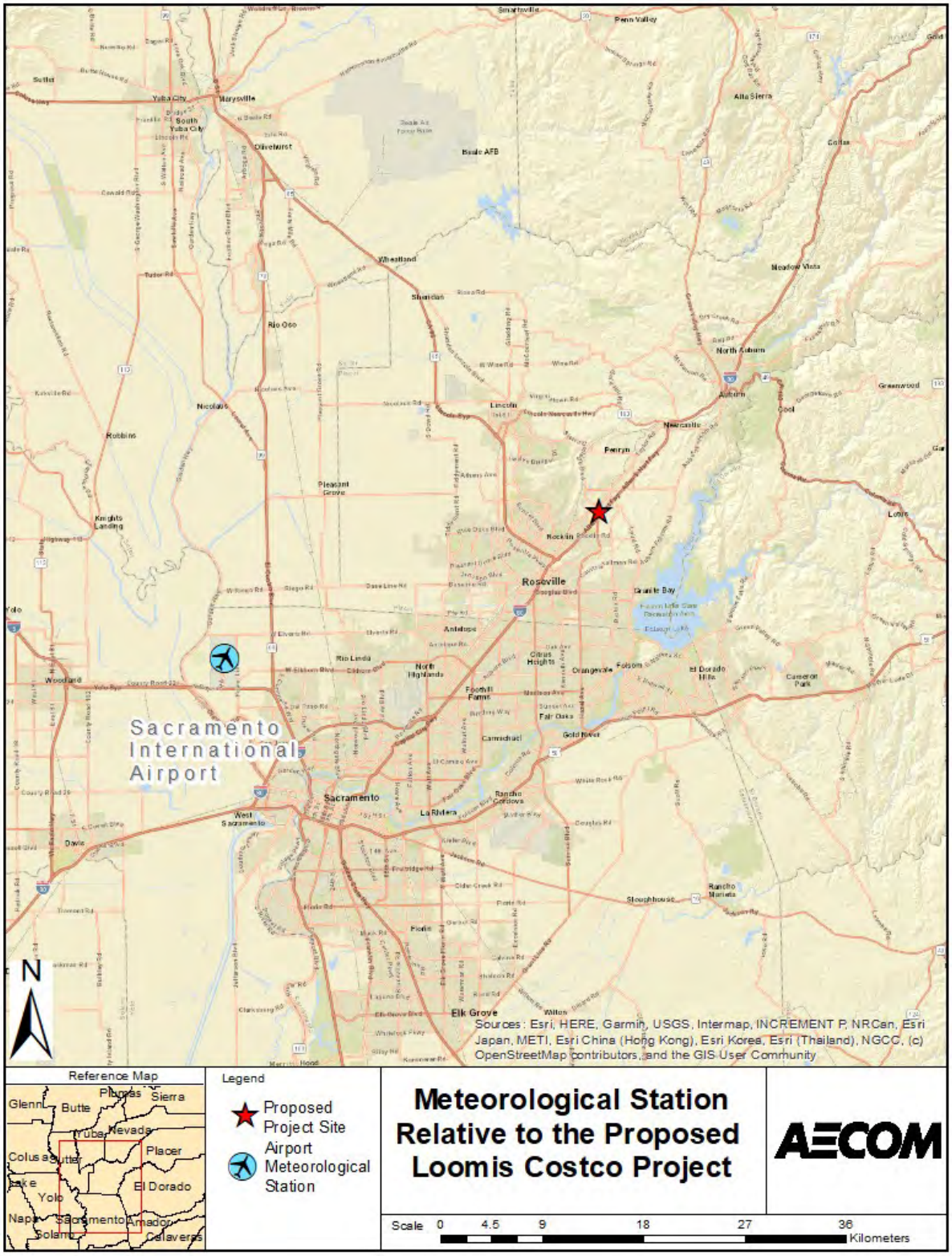


Figure 14

Locations of Meteorological Stations



Receptor Locations

Sensitive receptor locations for the proposed project are shown in **Figures 2 and 3**. The receptors were assigned a flagpole height of 1.8 meters for the ground level residences. CAPCOA recommends a receptor spacing of 25 meters for cases with emissions from short stacks or vents and that have a close property line. Given the proximity to residential dwellings along the east and northern properly line, 20-meter receptor intervals were used to adequately assess health risks in the near field. This 20-meter receptor spacing was used from the proposed project boundary line outward to 1,000 feet. This is consistent with other California air district guidance, such as the Bay Area Air Quality Management District (BAAQMD) (2017) since PCAPCD does not have receptor placement guidance. Beyond 1,000 feet and out to 2 kilometers, a receptor spacing of 100 meters was used as the area of maximum exposure typically occurs close to the source(s). This approach, of using a nested receptor grid with fine receptor spacing near the source to a coarser resolution farther away is consistent with CAPCOA and other California air district guidance.

Terrain elevations were obtained from commercially available digital terrain elevations developed by the U.S. Geological Survey by using its National Elevation Dataset (NED). The NED data provide terrain elevations with 1-meter vertical resolution and 10-meter (1/3 arc-second) horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. The U.S. Geological Survey specifies coordinates in North American Datum 83, UTM Zone 10. Lakes Environmental software was used to process the NED data and assign elevations to the receptor locations and sources.

Construction Sources

Off-road construction equipment was represented by adjacent volume sources covering the footprint of the project site. The release height of these sources was set to 5 meters and the initial vertical dimension was set to 2.3 meters. The lateral dimensions of each volume source were set to 20 meters, which is consistent with South Coast Air Quality Management District guidance (SQAQMD, 2008) for adjacent volume sources over an area greater than 5 acres. PCAPCD does not have guidance pertaining to model set up options.

On-road emissions from construction-worker vehicles, haul trucks, and material delivery trucks, and on-site work trucks traveling to and from the project site were also modeled as adjacent volume sources. The release height of these sources was set to 4.25 meters and the initial vertical dimension was set to 2.3 meters. The initial lateral dimension varies depending on roadway width. In coordination with the project sponsor and the transportation consultant, Kittelson and Associates, it was assumed that construction-worker vehicles, and material delivery trucks would approach the project site from a single direction. All traffic would come from I-80 would exit onto Sierra College Boulevard and turn north until arriving at the proposed project site. All traffic exiting the project site would enter Sierra College Boulevard and travel south on Sierra College Boulevard to the southbound on-ramp toward I-80. On-road traffic within 1,000 feet of the Project site was modeled. **Figures 4** and **5** illustrate the proposed construction on-road vehicle routes modeled for the two construction options described earlier.

Construction is anticipated to occur Monday through Friday from 8 a.m. to 5 p.m. (1,170 hours over the 6-month construction phase period). As such, these hours were modeled in AERMOD using the EMISFACT HRDOW keywords. This would include construction diesel particulate matter emissions.

Operational Sources

Operational emission sources evaluated in the dispersion modeling include bulk transfer (loading), pressure driven losses (breathing), fueling/hose permeation and spillage processes associated with the fueling station, along with delivery trucks idling and exhaust from diesel engines powering TRUs and on-road vehicles. Modeling assumed loading and breathing processes as point sources, while refueling and spillage were included as adjacent volume sources. The stack height used for the point source modeling of loading and breathing processes was 12 feet. The exhaust gas temperature used was 65°F for loading and 60°F for breathing, which are defined by CAPCOA for underground tanks. A mass emission rate and subsequent gas exit velocity were derived based on formulas provided by ARB that incorporate the emission factors (described in Section 2.0), annual gasoline throughput and

diameter of the release point (which is recommended by CAPCOA to be 2 inches). The modeled stack parameters are summarized in **Table 2**. Velocity calculations are provided in **Attachment B**.

Modeling assumed the emissions from refueling and spillage associated with the project site's fueling station as adjacent volume sources. To be consistent with the CAPCOA guidance, the release height of the refueling sources was set to 1 meter and the initial vertical dimension was set to 1.86 meters. The initial lateral dimension was determined by taking width of the proposed fueling station canopy (160 feet) and dividing that evenly across 5 volume sources. Spillage was represented in the model using the same locations and dimensions of the refueling volume sources, but with a release height of 0.0 meters, effectively at ground level. For the vehicles in queue waiting to refuel, adjacent volume sources were used to characterize these emissions in the model. The release height was set to 1.7 meters and the initial vertical dimension was set to 0.79 meters. The initial lateral dimension was determined by taking the width of the all the proposed queue lanes together and dividing that evenly across 7 volume sources.

Modeling parameters used to characterize emissions associated with diesel truck idling were based on guidance provided in CAPCOA Workshop's Health Risk Assessments and Land Use presentation (2010). The guidance provides a high vertical or horizontal exhaust release from a point stack. This HRA conservatively assumes that all exhaust parameters from delivery trucks associated with the proposed project would have high horizontal releases. The exhaust parameters used in this HRA for delivery trucks are listed in **Table 5**. The location of the truck emissions was determined based on a typical semitrailer length as defined by the California Department of Transportation (2018). A semitrailer has a maximum length of 48 feet. The location of the delivery truck stacks included in this modeling were located 48 feet away from the delivery bay as the trucks would be positioned with the truck cab farthest from the bay and the trailer closest. A sensitivity analysis was conducted to determine the worst-case location of the truck with a TRU in the model. A 1 g/s emission rate was used along with the stack parameters listed in **Table 5**. Of the four idling truck locations, the worst-case position was located closest to the warehouse building and farther from Sierra College Boulevard. Therefore, the truck with a TRU and the TRU stack were both positioned at the truck bay closest to the warehouse building.

In addition, CAPCOA provides point stack parameters to use in the modeling of TRU emissions sources. The exhaust parameters for the TRU sources are provided in **Table 5**. The location of the TRU emission uses the same methodology described above for the location of the truck emissions, which is approximately 48 feet from the delivery bays given that the location of the exhaust vent/stack would be at the front of the trailer.

Modeling assumed the on-road emissions from operational vehicles associated with the project site as adjacent volume sources. The release height of customer and worker traffic sources was set to 1.7 meters and the initial vertical dimension was set to 0.79 meters. The initial lateral dimensions vary depending on roadway width. For truck deliveries, both to the warehouse and gasoline, the release for these sources was set to 4.25 meters and the initial vertical dimension was set to 2.3 meters. The initial lateral dimensions vary depending on roadway width. On-road traffic within 1/4 mile of the project site was modeled based on inbound and outbound traffic routes outlined in the TIA. **Figures 7** through **12** illustrate the proposed operational on-road vehicle routes modeled for each option. The EMFAC TOG Speciation profile was used to model TACs from vehicles as shown in **Table 6**.

TABLE 5
MODELING PARAMETERS FOR TAC SOURCES

Point Sources						
Source	Model IDs	Stack Orientation	Release Height (m)	Temperature (K)	Exit Velocity (m/s)	Diameter (m)
Gasoline Loading	GAS_L1-L15	Capped[1]	3.66	291.48	0.0071	0.051
Gasoline Breathing	GAS_B1-B15	Capped[1]	3.66	288.71	0.0021	0.051
Non-TRU Delivery Truck	TRUCK1-3	Horizontal[1]	3.84	366.00	51.71	0.100
TRU Delivery Truck	TRUCKTRU	Horizontal[1]	3.84	366.00	51.71	0.100
TRU	TRU	Vertical	3.96	501.00	49.00	0.044
Gasoline Delivery Truck	TRUCKGAS	Horizontal[1]	3.84	366.00	51.71	0.100

Volume Sources				
Source	IDs	Release Height (m)	Initial Sigma-Y (m)	Initial Sigma-Z (m)
Gasoline Spillage	SPILL1-60	0.00	4.00	1.86
Gasoline Refueling	REFUEL1-60	1.00	4.00	1.86
Vehicles in Queue	QUEUE 1-28	1.70	1.86	0.79

[1] For capped and horizontal stacks, AERMOD conducts internal computations that suppress the plume momentum. See Section 6.1 of EPA's AERMOD Implementation Guide (USEPA 2018).

Table 6
Proposed EMFAC GasOline Tog speciation

Toxic Compounds	EMFAC Gasoline TOG Speciation (% of TOG)
Acetaldehyde	0.28%
Acrolein	0.13%
Benzene	2.47%
1,3-Butadiene	0.55%
Ethylbenzene	1.05%
Formaldehyde	1.58%
Hexane	1.60%
Methanol	0.12%
Methyl Ethyl Ketone	0.02%
Naphthalene	0.05%
Propylene	3.06%
Styrene	0.12%
Toluene	5.76%
Xylenes	4.80%

Notes: EMFAC = Emission Factors; TOG = total organic gases
Source: EMFAC2017 Model

4.0 Health Risk Analysis Methodology

Pollutant Concentrations

Emissions from the above sources were run in AERMOD to determine air pollutant concentrations at sensitive receptor locations. AERMOD was run using unit emissions. Each source group was modeled assuming emissions of 1 gram per second (g/s) divided by the number of sources for point sources or 1 g/s divided by the number of volume

sources. The unitized AERMOD results for each source group are output in $\mu g/m^3$ per g/s [$(\mu g/m^3)(g/s)^{-1}$]. Maximum hourly and period-average plot files generated by AERMOD as described above were input to HARP2 with corresponding TAC emission rates for the project operational emissions to calculate project pollutant concentration contributions. These concentrations were then used to estimate the acute and long-term effects of TACs on nearby sensitive receptor locations.

Receptor Exposure and Health Risk Calculations

Exposure factors were used to calculate the dose associated with exposure to the estimated unit concentration results obtained using AERMOD. ARB created the HARP2 software to assist in the development of emissions inventories, dispersion modeling, and risk assessment. For this project, HARP2 was used solely to estimate cancer risk via HARP2's Air Dispersion Modeling and Risk Tool (ADMRT), Version 19121; ADMRT was developed to encapsulate the exposure factors and guidance of the 2015 OEHHA Health Risk Assessment (OEHHA, 2015). AECOM evaluated the 30-year cancer risk for resident receptors through the inhalation, soil ingestion, mother's milk, and homegrown produce pathways, using the OEHHA-Derived Method. Factors that affect the dose that a receptor would receive include but are not limited to age-specific daily breathing rates as well as exposure time, frequencies, and duration. The general formula for calculating residential inhalation risk is as follows:

$$\mathbf{RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH}$$

Where:

$RISK_{inh\text{-}res}$	= Residential inhalation cancer risk
$DOSE_{air}$	= Daily inhalation dose (milligrams/kilogram [mg/kg]-day)
CPF	= Inhalation cancer potency factor (mg/kg-day^{-1})
ASF	= Age sensitivity factor for a specified age group (unitless)
ED	= Exposure duration (in years) for a specified age group
AT	= Averaging time for lifetime cancer risk (years)
FAH	= Fraction of time spent at home (unitless)

The inhalation risk was calculated in HARP2 using the OEHHA 2015 recommended default values for these parameters:

CPF	= Substance-specific
ASF	= 10 for 3rd trimester of pregnancy to age 2, 3 for age 2 to 16, 1 for age 16 to 30
ED	= 0.25 years for 3rd trimester, 2 years for age 0 to 2, 7 years for age 2 to 9, 14 years for age 2 to 16, 14 years for age 16 to 30
AT	= 70 years
FAH	= 1.0 (no adjustment)

The daily inhalation dose is defined as:

$$\mathbf{DOSE_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10^{-6}}$$

Where:

$DOSE_{air}$	= Dose through inhalation (mg/kg-day)
C_{air}	= Concentration in air ($\mu g/m^3$)
{BR/BW}	= Daily Breathing rate normalized to body weight (Liters/kilogram body weight - day)
A	= Inhalation absorption factor (unitless)
EF	= Exposure frequency (unitless), days/365 days
10^{-6}	= Micrograms to milligrams conversion, liters to cubic meters conversion

The daily inhalation dose will be calculated in HARP2 using OEHHA 2015 recommended default values for these parameters:

C_{air}	= Concentration as calculated from AERMOD

{BR/BW}	= OEHHA derived method (i.e. 95th percentile) estimates (361 for 3rd trimester of pregnancy, 1090 for age 0 to 2, 745 for age 2 to 16, 335 for age 16 to 30)
A	= 1
EF	= 0.96 (350 days/365 days in a year for a resident)

Non-cancer health risks for chronic exposure (a one-year average exposure and an 8-hour average chronic non-cancer health impact from repeated 8-hour exposure) and acute exposure (one-hour average) were calculated by HARP2 using the hazard index (HI) approach for the receptors and toxic substances emitted from the project.

For each TAC, the hazard quotient (HQ) was calculated by dividing the predicted exposure from the model by the reference exposure level (REL) for the substance. The HQs were then summed to calculate the HQ. Because substances may affect different target organ systems, such as the pulmonary or gastrointestinal systems, the HIs were calculated separately for each target organ system, and the highest HI was used to characterize the potential health risks.

The cancer potency factors and RELs used are consistent with the current values published by CARB (2018c). The RELs are intended to represent exposure levels below which adverse health effects do not occur. Therefore, an HI below one indicates that the project will not cause adverse health risks.

HARP2 Output Options

Maximum impact locations include the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW). The off-site location with the highest estimated impact level for acute exposure is the Point of Maximum Impact (PMI). The PMI typically occurs on or near the property line, where air toxic concentrations are highest. The MEIR is the off-site location of a residence that has the highest estimated impact for each health effect. The MEIW is conservatively assumed to occur at the PMI.

The following HARP2 options were used for the risk analysis to estimate impacts at the PMI, the MEIR, and the MEIW:

- 30-year Resident Cancer Risk – RMP Using the Derived Method
- 9-year (child resident) Cancer Risk – RMP Using the Derived Method
- Worker Cancer Risk – OEHHA Derived Method
- Chronic Hazard Index – OEHHA Derived Method
- 8-hour Average Chronic Noncancer Health Impact – OEHHA Derived Method
- Acute Hazard Index

HRA Results

Health risks are provided in terms of cancer and non-cancer risks, where the non-cancer risks are further divided into chronic (long-term and 8-hour) and acute (short-term) risks. Health risks were evaluated for each of the three configuration options of the proposed project.

Cancer Risk

The HRA included estimates of health risks associated with long-term (multi-year) exposures resulting from emissions of carcinogens. The maximum individual excess cancer risk is an estimate of the highest increased cancer risk an off-site individual can expect from a 30-year exposure to emissions of toxic substances from the facility. None of the TACs listed in Section 2.0 are multi-pathway TACs for cancer risk, therefore the HARP2 model calculates the individual excess cancer risk by summing the contributions due to the inhalation pathway only. The only multi-pathway toxic air contaminants emitted by the facility are benzene (blood), MTBE (kidney, liver, eye) and toluene (central nervous system, reproductive) for non-cancer chronic health effects; these toxics are not multi-pathway carcinogens.

Option A

Table 7 presents the locations and cancer risks for the off-site MEIR and the MEIW for the proposed project Option A scenario. At the MEIR, cancer risk is calculated on a 30-year basis for an adult, and on a 9-year basis for a child, to account for variable residence times. Cancer risk for the MEIW is calculated on a 25-year exposure basis assuming most workers will be present during the same hours as gas station operation. Cancer risks are below the significance level of 10 in a million at the residential and worker receptors. For construction the 8-hour worker period was assumed to be 8 a.m. to 4 p.m. to overlap with construction emissions and for operations the 8-hour worker period was assumed to be 5 a.m. to 1 p.m. to overlap with gasoline dispensing and delivery truck traffic.

Table 7
Summary of Cancer Risks (Option A)

Phase	Cancer Risk (in a Million)		
	30-Yr Resident (MEIR)	9-Yr (Child)	25-Yr (Offsite Worker) (MEIW)
Construction	4.22	4.22	0.12
Operations	2.76	2.05	4.05
Total Cancer Risk	6.98	6.27	4.17
Significance Threshold	10.0	10.0	10.0
Exceed Threshold?	No	No	No

Notes: units are in micrograms per cubic meter.
1 MEIR Receptor Location: 655924.60 E, 4297230.73 N
2 MEIW Receptor Location: 655884.60 E, 4296930.73 N

The locations of the MEIR and MEIW for cancer risk are shown in **Figure 15** for the proposed project Option A scenario. The MEIW is located south of the southwestern property boundary. The MEIR is located north of the property. The 30-year cancer risk at the MEIR and 25-year cancer risk at the MEIW by chemical is presented in **Table 8**. **Figures 15** and **16** illustrate the cancer risk above 1 in a million for residential receptors and for workers using contour plots, respectively. These figures are only presented for Option A as this is the controlling scenario with the highest cancer risk out of the three options. The aerial extent of the cancer risk exceeding 1 in a million for Options B and C would be smaller than Option A.

Table 8
MEIR and MEIW Cancer Risks by Substance (Option A)

TAC	Cancer Risk (in a million)						
	Project Phase	Diesel Particulate Matter	Benzene	Toluene	Xylenes	MTBE	Total
MEIR Cancer Risk	Construction	4.22E+00	1.17E-05	0.00E+00	0.00E+00	0.00E+00	4.22E+00
	Operations	1.25E+00	1.02E+00	0.00E+00	0.00E+00	2.74E-01	2.54E+00
MEIW Cancer Risk	Construction	1.21E-01	2.05E-06	0.00E+00	0.00E+00	0.00E+00	1.21E-01
	Operations	5.93E-01	2.54E+00	0.00E+00	0.00E+00	7.18E-01	3.85E+00

Option B

Table 9 presents the locations and cancer risks for the off-site MEIR and the MEIW for the proposed project Option B scenario. At the MEIR, cancer risk is calculated on a 30-year basis for an adult, and on a 9-year basis for a child, to account for variable residence times. Cancer risk for the MEIW is calculated on a 25-year exposure basis assuming most workers will be present during the same hours as gas station operation. Cancer risks are below the significance level of 10 in a million at the residential and worker receptors. For construction the 8-hour worker period was

assumed to be 8 a.m. to 4 p.m. to overlap with construction emissions and for operations the 8-hour worker period was assumed to be 5 a.m. to 1 p.m. to overlap with gasoline dispensing and delivery truck traffic.

Table 9
Summary of Cancer Risks (Option B)

Phase	Cancer Risk (in a Million)		
	30-Yr Resident (MEIR)	9-Yr (Child)	25-Yr (Offsite Worker) (MEIW)
Construction	3.96	3.96	0.10
Operations	1.67	1.21	3.47
Total Cancer Risk	5.63	5.17	3.57
Significance Threshold	10.0	10.0	10.0
Exceed Threshold?	No	No	No

Notes: units are in micrograms per cubic meter.
1 MEIR Receptor Location: 655924.60 E, 4297230.73 N
2 MEIW Receptor Location: 655884.60 E, 4296930.73 N

The locations of the MEIR and MEIW are shown in **Figure 15** for the proposed project Option B scenario. The MEIW is located south of the southwestern property boundary. The MEIR is located north of the property. The 30-year cancer risk at the MEIR and 25-year cancer risk at the MEIW by chemical is presented in **Table 10**.

Table 10
MEIR and MEIW Cancer Risks by Substance (Option B)

TAC	Cancer Risk (in a million)						
	Project Phase	Diesel Particulate Matter	Benzene	Toluene	Xylenes	MTBE	Total
MEIR Cancer Risk	Construction	3.96E+00	1.17E-05	0.00E+00	0.00E+00	0.00E+00	3.96E+00
	Operations	2.77E-01	9.78E-01	0.00E+00	0.00E+00	2.79E-01	1.53E+00
MEIW Cancer Risk	Construction	9.84E-02	1.50E-06	0.00E+00	0.00E+00	0.00E+00	9.84E-02
	Operations	9.04E-02	2.51E+00	0.00E+00	0.00E+00	7.18E-01	3.32E+00

Option C

Table 11 presents the locations and cancer risks for the off-site MEIR and the MEIW for the proposed project Option C scenario. At the MEIR, cancer risk is calculated on a 30-year basis for an adult, and on a 9-year basis for a child, to account for variable residence times. Cancer risk for the MEIW is calculated on a 25-year exposure basis assuming most workers will be present during the same hours as gas station operation. Cancer risks are below the significance level of 10 in a million at the residential and worker receptors. For construction the 8-hour worker period was assumed to be 8 a.m. to 4 p.m. to overlap with construction emissions and for operations the 8-hour worker period was assumed to be 5 a.m. to 1 p.m. to overlap with gasoline dispensing and delivery truck traffic.

Table 11
Summary of Cancer Risks (Option C)

Phase	Cancer Risk (in a Million)		
	30-Yr Resident (MEIR)	9-Yr (Child)	25-Yr (Offsite Worker) (MEIW)
Construction	3.96	3.96	0.10
Operations	1.73	1.25	3.48
Total Cancer Risk	5.68	5.21	3.58
Significance Threshold	10.0	10.0	10.0
Exceed Threshold?	No	No	No

Notes: units are in micrograms per cubic meter.
1 MEIR Receptor Location: 655924.60 E, 4297230.73 N
2 MEIW Receptor Location: 655884.60 E, 4296930.73 N

The locations of the MEIR and MEIW are shown in **Figure 15** for the proposed project Option C scenario. The MEIW is located south of the southwestern property boundary. The MEIR is located north of the property. The 30-year cancer risk at the MEIR and 25-year cancer risk at the MEIW by chemical is presented in **Table 12**.

Table 12
MEIR and MEIW Cancer Risks by Substance (Option C)

TAC	Cancer Risk (in a million)						
	Project Phase	Diesel Particulate Matter	Benzene	Toluene	Xylenes	MTBE	Total
MEIR Cancer Risk	Construction	3.96E+00	1.17E-05	0.00E+00	0.00E+00	0.00E+00	3.96E+00
	Operations	3.29E-01	9.81E-07	0.00E+00	0.00E+00	2.79E-01	1.59E+00
MEIW Cancer Risk	Construction	9.84E-02	1.50E-06	0.00E+00	0.00E+00	0.00E+00	9.84E-02
	Operations	9.88E-02	2.51E+00	0.00E+00	0.00E+00	7.18E-01	3.33E+00

Chronic Non-Cancer Risks

Table 13 presents the locations and chronic non-cancer hazard index (HI) for the PMI, the MEIR, and the MEIW for proposed project Options A, B, and C. The HIs are well below the significance level of 1 for all scenarios. The PMI is located south of the southwestern property boundary.

Table 13
Summary of Chronic Non-Cancer Risks

Scenario	Receptor	Location, UTM		Hazard Index
		East (m)	North (m)	
Option A	MEIW	655884.60	4296930.73	0.04
	MEIR	655724.60	4296790.73	0.01
Option B	MEIW	655884.60	4296930.73	0.04
	MEIR	655724.60	4296790.73	0.01
Option C	MEIW	655884.60	4296930.73	0.04
	MEIR	655724.60	4296790.73	0.01

8-hour Chronic Non-Cancer Risks

For the 8-hour Benzene chronic risk, the daily 8-hour average ground level concentrations were calculated using the postfile output from AERMOD and an 8-hour period from hour ending 9 a.m. to hour ending 5 p.m. **Table 14** presents the locations and 8-hour chronic HIs for the PMI, the MEIR and the MEIW for proposed project Options A, B, and C. The PMI is located south of the southwestern property boundary. The 8-hour HIs are below the significance level of 1.

Table 14
Summary of 8-hour Chronic Non-Cancer Risks – Option A

Scenario	Receptor	Location, UTM		Hazard Index	Significance Threshold	Exceed Threshold?
		East (m)	North (m)			
Option A	PMI	655864.60	4296930.73	0.16	1.0	No
	MEIW	655884.60	4296930.73	0.15	1.0	No
	MEIR	655724.60	4296790.73	0.02	1.0	No
Option B	PMI	655864.60	4296930.73	0.16	1.0	No
	MEIW	655884.60	4296930.73	0.15	1.0	No
	MEIR	655724.60	4296790.73	0.02	1.0	No
Option C	PMI	655864.60	4296930.73	0.16	1.0	No
	MEIW	655884.60	4296930.73	0.15	1.0	No
	MEIR	655724.60	4296790.73	0.02	1.0	No

Acute Non-Cancer Risks

Table 15 presents the locations and acute HI for the PMI, the MEIR and the MEIW for proposed project Options A, B, and C. The PMI is located west of the Costco property. The acute HIs are below the significance level of 1.

Table 15
Summary of Acute Non-Cancer Risks – Option A

Scenario	Receptor	Location, UTM		Hazard Index	Significance Threshold	Exceed Threshold?
		East (m)	North (m)			
Option A	PMI	655784.60	4296990.73	0.26	1.0	No
	MEIW	655864.60	4296930.73	0.16	1.0	No
	MEIR	656104.60	4297010.73	0.10	1.0	No
Option B	PMI	655784.60	4296990.73	0.25	1.0	No
	MEIW	655864.60	4296930.73	0.16	1.0	No
	MEIR	656104.60	4297010.73	0.09	1.0	No
Option C	PMI	655784.60	4296990.73	0.25	1.0	No
	MEIW	655864.60	4296930.73	0.16	1.0	No
	MEIR	656104.60	4297010.73	0.09	1.0	No

Figure 15
Locations of PMI, MEIR and MEIW for Cancer Risk (Options A/B/C)

Figure 16
Plot of Cancer Risk Concentrations > 1 in-a-million for Residential Sensitive Receptors for Controlling Project Scenario (Option A)

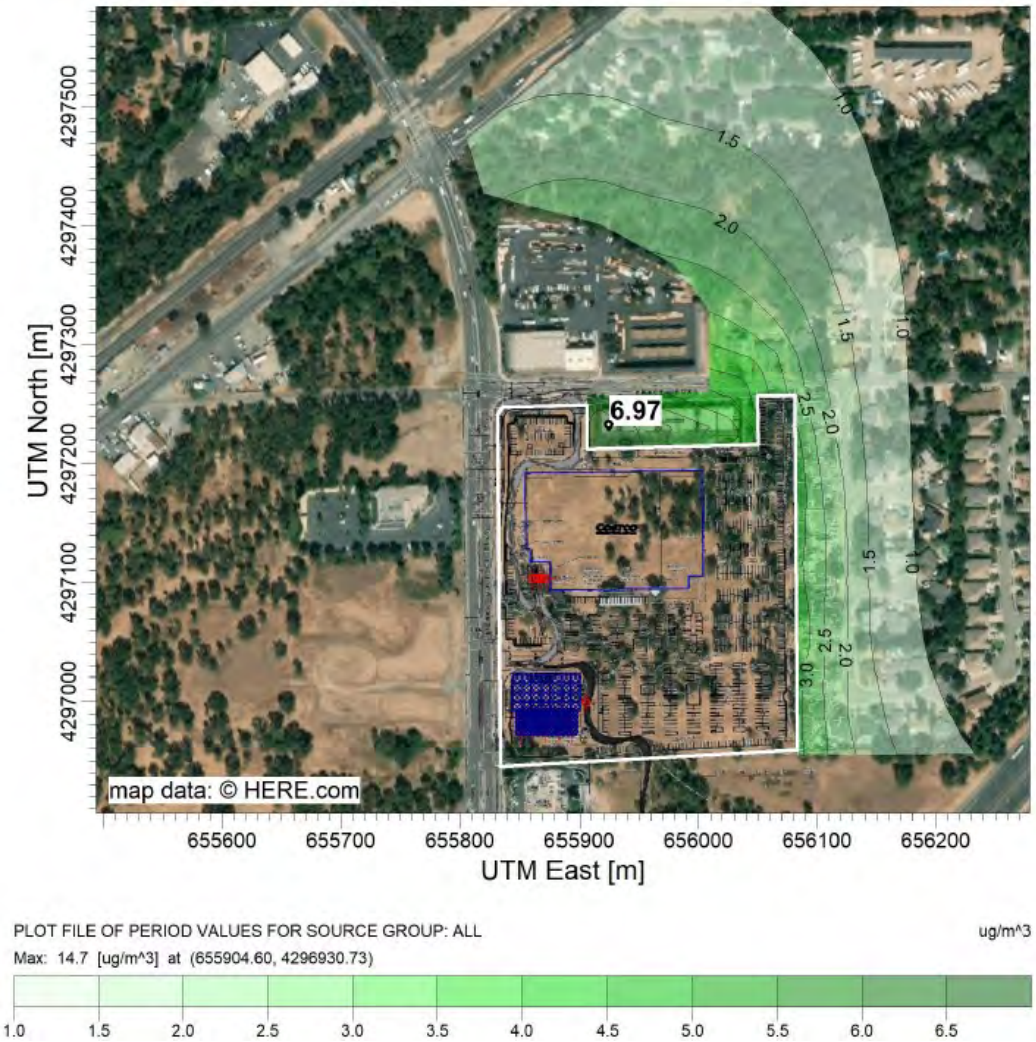
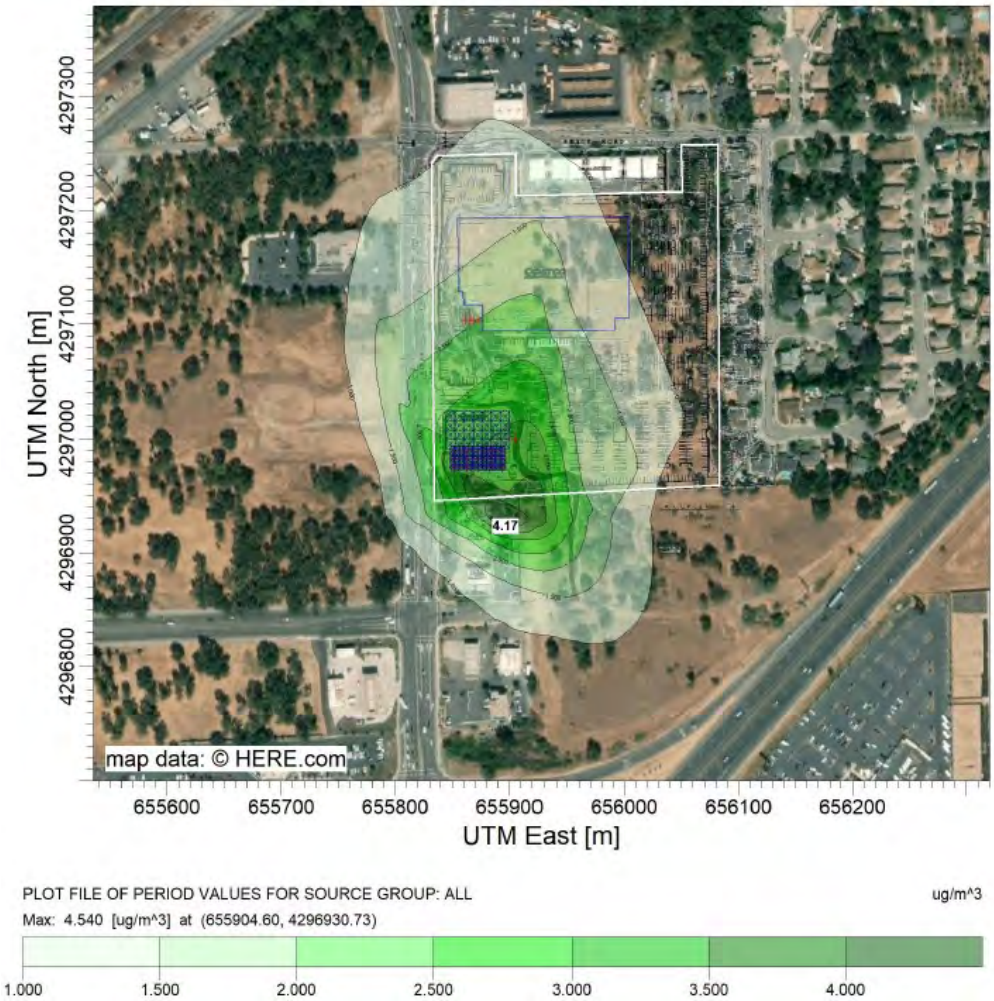


Figure 17
Plot of Cancer Risk Concentrations > 1 in-a-million for Worker Sensitive Receptors for Controlling Project Scenario (Option A)



6.0 Cumulative Health Risk

This section assesses cumulative cancer risk at off-site sensitive receptors that could result from existing sources, project sources, and other nearby projects.

Cumulative Projects

There are no known other projects located within 1,000 feet of the project site and this project is not adding any new sensitive receptors. Therefore, the cumulative modeling analysis only includes the proposed project.

Cumulative Analysis for Off-site Sensitive Receptors

There are three other gasoline dispensing stations (Arco, Chevron, and 7-Eleven) located within 1,000 feet of the Project as well as the highly traveled I-80 corridor. The Arco station has 16 dispensers, the Chevron station has 12 dispensers, and the 7-Eleven has 12 dispensers, for a total of 40 dispensers. These three gasolines dispensing stations are approximately the same distance from the MEIR as the proposed gasoline dispensing station.

Based on the cancer risk at the MEIR presented in Tables 7, 9 and 11 for the 3 proposed options, over 95% of the cancer risk is due to DPM from construction equipment. The cancer risk due to operations of the project is less than

3.0 in a million for any of the 3 proposed options. At the residences closer to the gasoline dispensing stations, the cancer risk due to operations is 0.89, 0.56 and 0.62 in a million for proposed options A, B and C, respectively. For the 40 dispensers at the other three gasoline dispensing stations, the project cancer risk could be scaled by the number of dispensers such that the cancer risk due to these three existing gasolines dispensing stations would be approximately 0.5 in a million.

The residences located east of the Project, closest to the I-80 corridor, likely receive the highest cancer risk due to DPM from trucks traveling on the highway. Several of these residences are within 500 feet of I-80 but these are further from the Project and the gasoline dispensing stations. The wind direction to expose these residences to DPM emissions from I-80 is different than that of the Project. Therefore, impacts on these residences would be either from the Project or from the on-road sources along I-80 and not the sum of the two. Given that the exposures from the Project are below 2 in a million for these residences, the cumulative risks would be less than significant.

7.0 Uncertainties

In accordance with risk assessment guidance, the following discussion summarizes the main uncertainties associated with the emissions estimation, air dispersion modeling, and risk estimation components of the HRA methodology.

Emissions Estimates

Uncertainties exist in estimating emissions from operational TAC emissions from potential stationary sources associated with the fueling station as new CAPCOA guidance regarding estimating risk from fueling stations will be released in the coming months.

Air Dispersion Modeling

In addition to the uncertainty associated with emission estimates, uncertainty exists regarding the pollutant concentrations estimated by the air dispersion model. The limitations of the air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to EPA, errors attributable to the limitation of the algorithms implemented in the air dispersion model in the highest estimated concentrations of +/- 10 percent to 40 percent are typical (EPA, 2017). AECOM's methodologies use conservative assumptions and techniques to produce conservative results; thus, predicted exposure concentrations are likely to be at or above actual exposure concentrations.

The source parameters used to model emission sources add uncertainty. For all emission sources, AECOM uses source parameters that are either recommended as defaults or expected to produce more conservative (worst-case) results. Discrepancies might exist between the actual emissions characteristics of a source and its representation in the model; exposure concentrations used in this assessment represent approximate exposure concentrations.

Health Risk Analysis

Numerous assumptions must be made to estimate human exposure to pollutants. These assumptions include parameters such as breathing rates, exposure time and frequency, exposure duration, and human activity patterns. While a mean value derived from scientifically defensible studies is the best estimate of central tendency, most exposure variables used in this HRA are high-end estimates. For example, it is assumed that residential receptors would be exposed to project emissions for 8,760 hours per year. This assumption is highly conservative because most residents do not remain in their homes for this period, and the gas station is anticipated to only operate daily from 5 a.m. to 10 p.m. The combination of several high-end estimates used as exposure parameters may substantially overestimate chemical intake. The excess lifetime cancer risks calculated in this assessment are therefore likely to be higher than may be required to be protective of public health.

The OEHHA Cancer Potency Factor (CPF) for diesel PM is used to estimate cancer risks associated with exposure to diesel PM from the project and off-site emissions. However, the CPF derived by OEHHA for diesel PM is highly uncertain in the estimation of both response and dose. In the past, because of inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, had classified diesel PM as Probably Carcinogenic to Humans (Group 2); EPA had also

concluded that the existing data did not provide an adequate basis for quantitative risk assessment (EPA, 2002). However, based on two recent scientific studies (Benbrahim-Tallaa et al., 2012; Attfield et al, 2012), IARC recently reclassified diesel PM as Carcinogenic to Humans (Group 1) (IARC, 2012), which means that the agency has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by IARC may provide additional impetus for EPA to identify a quantitative dose/response relationship between exposure to diesel PM and cancer.

OEHHA notes that the conservative assumptions used in a risk assessment are intended to avoid underestimation of actual risks posed by a site and are designed to err on the side of health protection (OEHHA, 2015). The estimated risks in this HRA are based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. Although it is difficult to quantify the uncertainties associated with all the assumptions made in this risk assessment, the use of conservative assumptions is likely to result in substantial overestimates of exposure, and hence, risk.

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Attachment A

Data Assumption Tables

Attachment B

Health Risk Assessment Modeling Inputs

Appendix C Biological Resources Reports and Arborist Report

Biological Resources Report

DRAFT
BIOLOGICAL RESOURCES REPORT
COSTCO WHOLESALE PROJECT
TOWN OF LOOMIS, PLACER COUNTY, CALIFORNIA

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March 2017

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Figure 3. Aerial Photo of the Project Site
Figure 4. Costco Wholesale Project Conceptual Plan
Figure 5. Soil Map of the Project Site
Figure 6. Watershed Map of the Project Area
Figure 7. Map of Vegetation Communities at the Project Site
Figure 8. Wetlands and Waters of the U.S. Subject to Corps Jurisdiction
Figure 9. Impacts to Vegetation Communities Occurring on the Project Site
Figure 10. Impacts to Wetlands and Waters of the U.S. Subject to Corps Jurisdiction

ATTACHMENT 2. **Supplemental Biological Information**

Table 1. Plant List for Property
Table 2. Animal Species Observed on the Project Site or Expected to Utilize the Project Site
Table 3. Special Status Plants Known to Occur in the Vicinity of the Project Area, Placer County, California
Table 4. Special Status Animal Species that have been Reported in the Vicinity of the Project Area, Placer County, California.

ATTACHMENT 3. Arborist Report for Costco Site, Loomis, CA, prepared by Mann Made Resources, December 9, 2016.

ATTACHMENT 4. Wetland Delineation for the 17.88 Sierra-Brace Study Area, Town of Loomis, Placer County, California, prepared by Salix Consulting, Inc. May 2016.

ATTACHMENT 5. USACE Wetland Determination Letter, June 14, 2016

This report should be cited as: *Draft Biological Resources Report, Costco Wholesale Project, Town of Loomis, Placer County, California.* April 2017. San Rafael, California 36 pp. plus attachments. Prepared for Costco Wholesale.

1.0 INTRODUCTION

On behalf of Costco Wholesale, Huffman-Broadway Group, Inc. (HBG) has prepared a Biological Resources Report for the Costco Wholesale Project in The Town of Loomis, Placer County, California. It is expected that this Biological Resources Report will be incorporated into an environmental document prepared by Placer County to satisfy requirements of the California Environmental Quality Act (CEQA). This report describes biological resources and ecological constraints present on the 17.88-acre Project Site, including the presence of sensitive habitats and an evaluation of the potential for rare, threatened, or endangered species of flora and/or fauna to occur at the site or in the project vicinity. The report also includes a preliminary review of biological impacts associated with implementation of the project and recommended mitigation measures, as needed.

Our analysis included a review of pertinent literature on habitat characteristics of the site, species of plants and animals expected to utilize the site, a review of planning documents referencing ecological aspects of the site, and field site surveys. The Biological Resources Report also incorporates the results of a wetland jurisdictional determination prepared for the site by Salix Consulting Inc., in May of 2016. This report was a detailed delineation of wetlands and waters of the United States at the property, conducted per criteria of the U.S. Army Corps of Engineers, and the results of the wetland delineation are summarized herein. Also considered is an Arborist's Report prepared by Mann Made Resources. Both the wetland delineation and arborist's report are included as attachments. The California Natural Diversity Data Base (CNDDB) was consulted to determine if any populations of endangered, threatened, or rare species have occurred historically or currently are known to exist near the project. The study site was surveyed by HBG biologists during February of 2017.

2.0 PROJECT DESCRIPTION

2.1 Location of Project Site

The Project Site is in the Town of Loomis in Placer County, California. The site is north of Interstate 80, in the southeastern corner of the intersection between Sierra College Boulevard and Brace Road. The location corresponds to Section 28 of Township 11 North and Range 7 East on the 7.5 minute Rocklin, CA United States Geological Survey (USGS) quadrangle (Figure 1). The latitude and longitude of the approximate center of the site are 38°48'34" North and121°12'16" West. The Assessor Parcel Numbers (APNs) are 045-042-011, 045-042-012,045-042-023, 045-042-034, 045-042-035, 045-042-036, and 045-042-037.The property is located on the Loomis 7.5-minute U.S. Geographic (USGS) topographic quadrangle map.

Refer to Exhibit 1, Figure 1 for the project site location map, Figure 2 for the location of the project on the Loomis USGS 7.5-minute quadrangle map, and Figure 3 for an aerial photograph of the project site.

2.2 Project Description

Costco Wholesale is proposing to construct a Costco facility at the site as shown in Figure 4. The facility includes the Costco warehouse and associated parking and other planned infrastructure. The proposed project would cover the entire site.

3.0 EXISTING SETTING

3.1 Site Description

The Project Site is in the Town of Loomis in Placer County, California. The site is north of Interstate 80, in the southeastern corner of the intersection between Sierra College Boulevard and Brace Road. Adjacent land uses include a multi-family residential building along the northern boundary the Homewood Lumber complex to the north, single family residential to the east, commercial and undeveloped land to the south, and an office building and undeveloped land to the west (Figure 3). The study area is bounded by Brace Road to the north and Sierra College Boulevard to the west.

General features of the project site are as follows:

- **Soils and Topography**. One soil unit is mapped in the study area (Figure 5): Andregg coarse sandy loam, 2 to 9 percent slopes. Andregg soils are well drained and have moderately rapid permeability. This soil is neither ponded nor flooded. This soil does not meet hydric criteria. The study area is located at an elevation between approximately 320 and 340 feet. The topography of the study area gently slopes to the west.

- **Hydrology**. The Project Site is in the Dry Creek watershed (Hydrologic Unit Code 1802011101), as shown in the watershed map of Figure 6. A wetland swale and drainage ditch located in the southwest corner of the site drain water westerly and convey water offsite through culverts underneath Sierra College Boulevard. Water continues to drain westerly on the adjacent property and drains into Sucker Ravine which drains into Secret Ravine. Secret Ravine is a tributary of Miners Ravine, which ultimately reaches Dry Creek and then the American River. The constructed drainage in the northeastern corner conveys storm water and urban runoff from the residential development to the east through a storm drain system.

- **Vegetation**. Based on field reconnaissance by HBG conducted in February 2017 and review of the wetland jurisdictional report (Salix 2016), the Project Site is made up of Valley Oak Woodland, Annual Grassland and Valley Freshwater Marsh. Details of vegetation are provided below in Section 3.2.

- **Climate**. Loomis has a temperate Mediterranean climate with dry hot summers and mild winters. Average high temperature typically varies from 54 degrees F in the winter to approximately 92 degrees in the summer. Average rainfall for the area is approximately 25 inches per year, most occurring between November and April.

3.2 Biological Setting

3.2.1 Plant Communities

An HBG biologist conducted field reconnaissance of the project site on February 11, 2017. All habitats on the project sites were surveyed on foot and assessed for similarity to sites known to support special status species within the area. Qualitative information on the composition and distribution of plant species on the sites was obtained during the site visits. Plant communities were identified on aerial photographs of the site.

Vegetation communities are assemblages of plant species growing in an area of similar biological and environmental factors. Vegetation communities and habitats at the project site were identified based on the currently accepted List of Vegetation Alliances and Associations (or Natural Communities List) (CDFW 2010). The list is based on A Manual of California Vegetation, Second Edition (Sawyer and Keeler-Wolf 2009), which is the National Vegetation Classification applied to California. The project site contains three habitat types per this classification: Valley Oak Woodland (7.96 acres), Annual Grassland (10.16 acres), and Valley Freshwater Marsh (0.15 acres). Figure 7 shows the extent and distribution of vegetation types on the property. A list of plant species identified on the property during surveys is included in Attachment 2, Table 1. The main source for the plant list in Table 1 was the wetland delineation report prepared by Salix (2016), which was augmented with additional species noted during surveys by HBG.

Wetland habitats on-site were further classified using the U.S. Fish and Wildlife's Service's "Classification System for Wetland and Deepwater Habitats" (Cowardin et al. 1979); the wetlands at the property are defined as palustrine emergent seasonal wetlands, palustrine emergent vernal pools, and palustrine scrub-shrub wetlands per the Cowardin et al criteria.

Annual Grassland

Annual grassland is the predominant habitat type on site, comprising 10.16 acres, or approximately 56% of the land area. The Annual Grassland found on the property is comprised largely of non-native grasses and forage species. Grasses included Italian ryegrass *(Festuca perennis)*, ripgut grass (*Bromus diandrus)*, soft chess (*Bromus hordeaceus)*, wild oat (*Avena fatua)*, hedgehog dogtail (*Cynosurus echinatus*,) foxtail barley (*Hordeum jubatum)*, and medusahead (*Elymus caput-medusae)*. Forbs present include Italian thistle (*Carduus pycnocephalus*), California mugwort (*Artemisia douglasiana)*, field hedge parsley (*Torilis arvensis)*, klamathweed (*Hypericum perforatum)*, broad-leaf filaree (*Erodium botrys*,) common vetch (*Vicia sativa)*, and cut-leaf geranium (*Geranium dissectum)*, yellow starthistle (*Centaurea solstitialis)*, rose clover (*Trifolium hirtum)*, smooth's cat-ear (*Hypochaeris glabra)*, common fiddleneck (*Amsinckia menziesii)*, short-podded mustard (*Hirschfeldia incana)*, and bindweed (*Convolvulus arvensis*). The annual grassland onsite appears to be disked annually.

Valley Oak Woodland

Valley Oak Woodland comprises 7.96 acres or approximately 44% of the site. The foothill woodland varies in density throughout the site, being mostly open, and it is dominated by

valley oak (*Quercus lobata)* and interior live oak (*Quercus wislizeni)*, with a small number of blue oak (*Quercus douglasii)*, and a few scattered foothill pines (*Pinus sabiniana)*. Shrubs in the understory include thickets of coyote brush (*Baccharis pilularis)* and Himalayan berry (*Rubus armeniacus)*. Groundcover is mostly the non-native herbaceous plants and grasses that are noted as occurring in the Annual Grassland above.

A tree survey conducted on the site by Mann Made Resources (see Attachment 3) found 372 trees that were determined to be of protected size. These 372 trees consisted of 284 valley oaks, 86 Interior live oaks, and two blue oaks. Of these, 162 trees were found to be in good or fair condition and 210 trees were found to be in poor, very poor, or dead condition. The 210 trees included 68 trees in poor condition, 38 trees in very poor condition, and four trees that were dead. The Tree Preservation Ordinance of the Town of Loomis provided the requirements for data collection; blue oaks 4 inches in diameter and greater and valley and interior live oaks 6 inches in diameter and greater are considered Protected Trees. Detailed information regarding all trees on the property is included in the Tree Report (Mann Made Resources, see Attachment 3), including information on species, size, condition, suitability for preservation.

The California Oak Woodlands Conservation Program recognizes oak woodlands as a vital statewide resource providing benefits including wildlife habitat, monetary and ecological value, and an ability to reduce soil erosion, enhance water quality and moderate temperatures.

Valley Freshwater Marsh

Valley Freshwater Marsh habitat occurs within three separate swales occurring on the property. The marsh habitats total 0.15 acres. The three separate wetland swales are shown in Figure 7 and are described in detail in Section 3.2.3 (Wetland and Other Waters of the U.S. Delineation).

One of three swales flows westerly through the oak woodland into a culvert under Sierra College Boulevard. The eastern end of the swale is a small open area dominated by iris leaf rush (*Juncus xiphioides)*. The swale flows through a patch of coyote brush, and the lower portion of the swale includes wetland plant species such as hyssop loosestrife (*Lythrum hyssopifolia)*, curly dock (*Rumex crispus)*, prickly lettuce (*Lactuca serriola*,) Italian ryegrass, and Mexican rush *(Juncus mexicanus)*. A short swale in the northeast corner of the site is vegetated with Himalayan blackberry and flows under Starlight Lane. The third swale in the southwestern corner of the study area is an area where stormwater runoff drains onto the Project Site from nearby commercial development and travels about 175 feet before exiting the site through a culvert under Sierra College Boulevard. Wetland species such as water plantain (*Alisma triviale)*, speedwell (*Veronica* sp.), moth mullein (*Verbascum blattaria)*, water cress (*Nasturtium officinale)*, and curly dock are present.

3.2.2 Animal Populations

The species discussed in this study are based on review of available literature, visits to the area by HBG wildlife biologist for many years, and habitat observations made during qualitative surveys conducted by an HBG wildlife biologist on February 11, 2017. A complete listing of the references from which information was compiled on the flora and fauna inhabiting the region is

contained in the References section. Table 1 (Attachment 2) provides species lists based on these reconnaissance level observations for reptiles, amphibians, birds and mammals. The table lists all wildlife species observed or expected on the project sites and in the site vicinity and includes the scientific names of all species mentioned in the text.

The wetland habitats and the disturbed annual grassland and oak woodland habitats onsite support a variety of wildlife species. The complex of habitats includes the presence of small streams that can accommodate wildlife adapted to aquatic areas, and upland vegetation that provides potential foraging areas for species of mammals, reptiles, amphibians and birds. Native trees and shrubs are present along with native and non-native herbaceous plants and grasses that provide a mix of habitats suitable to support nesting by a variety of both passerine and non-passerine avian species.

Much of the wildlife observed at the site during the February 11 field reconnaissance included resident and wintering species of birds that are adapted to the mix of wetland and upland habitats found at the site. Resident bird species observed during the field review, many of which may also nest at or in the vicinity of the site, include red-shouldered hawk, Anna's hummingbird, mourning dove, Northern flicker, acorn woodpecker, Nuttall's woodpecker, black phoebe, western bluebird, California scrub-jay, European starling, Northern mockingbird, oak titmouse, bushtit, white-breasted nuthatch, Bewick's wren, California towhee, white-crowned sparrow, song sparrow, purple finch and house finch. Species observed that are expected only during the winter include red-breasted sapsucker, American robin, hermit thrush, ruby-crowned kinglet, yellow-rumped warbler, and golden crowned sparrow. Additional neotropical migrants that could be expected to nest at the site during the spring and summer months include Pacific-slope flycatcher, western wood-pewee, western kingbird, ash-throated flycatcher, black-headed grosbeak and Bullock's oriole. Additional wildlife surveys will be conducted by an HBG wildlife biologist in late-April or May of 2017.

Although no mammals were documented at the site, it is expected that mammals adapted to urban environments would be found on the property including striped skunk, raccoon, Virginia opossum, deer mouse and mule deer. Despite looking under logs and boards, no reptiles were observed and the only amphibian recorded was Pacific treefrog. Additional amphibians likely include western toad, and common reptiles likely include western fence lizard, southern alligator lizard, western skink, ringneck snake, gopher snake and common garter snake.

3.2.3 Wetland and Other Waters of the U.S. Delineation

Definitions of Wetlands and Other Waters of the U.S.

The Department of the Army, acting through the U.S. Army Corps of Engineers (Corps), has the authority to permit the discharge of dredge or fill material in waters of the U.S. under Section 404 of the Clean Water Act (CWA), and permit work and placement of structures in navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899 (RHA).

EPA and the Corps define wetlands as: "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal

circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (EPA regulations at 40 CFR § 230.3(t); Corps regulations at 33 CFR § 328.3(b)). The term "*under normal circumstances*" refers to situations in which the vegetation has not been substantially altered by man's activities as defined in Appendix A of the Corps' 1987 *Wetlands Delineation Manual*. Clarification of the term, as it pertains to farmed wetlands, was furthered defined in Regulatory Guidance Letter 90-7 dated September 26, 1990, as "the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed."

Under Section 10 of the Rivers and Harbors Act of 1899, the Corps also regulates the construction of structures in, over, or under; excavation of material from; or deposition of material into navigable waters. As described by Corps' regulation 33 CFR § 329.4, the general definition of "navigable waters" includes those waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or might be susceptible for use to transport interstate or foreign commerce. Several factors must be examined when making a determination whether a waterbody is a navigable water. These factors include (a) past, present, or potential presence of interstate or foreign commerce; (b) physical capabilities for use by commerce and (c) defined geographic limits of the waterbody. A determination of navigability, once made by the Corps, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impeded or destroy navigable capacity. Based on this provision, the Corps also has the discretion to regulate activities in historically navigable waters. Historically navigable waters are areas that were navigable in the past, but are no longer navigable because of artificial modifications, such as levees, dikes, and dams.

Furthermore, waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 C.F.R. §328.3(e)).

Detailed Wetland and Other Waters of the U.S. Delineation-Methodology

Salix Consulting, Inc. conducted a preliminary wetland delineation of the property in May of 2016 (Salix Consulting 2016) in accordance with Code of Federal Regulations (CFR) definitions of jurisdictional waters, the Corps' 1987 *Wetlands Delineation Manual* (1987 Manual), the Corps' 2008 *Regional Supplement to Corps of Engineers Wetland Delineation Manual: Arid Wes, Version 2.0* (Arid West Regional Supplement) and supporting guidance documents. The 1987 Manual provides technical guidance and procedures, from a national perspective, for identifying and delineation of wetlands that may be subject to Section 404 of the CWA. Pursuant to the 1987 Manual, key criteria for determining the presence of wetlands are: (a) the presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by groundwater or surface water; and (b) a prevalence of vegetation typically adapted for life in saturated soil conditions (i.e., hydrophytic vegetation). Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and

vegetation. The Arid West Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. The combined use of the 1987 Manual and Arid West Regional Supplement enhances the technical accuracy, consistency, and credibility of wetland determinations.

Detailed Wetland Delineation-Results

A total of 0.15 acres of vegetated palustrine emergent wetlands were found within the project site as shown in Figure 8. This finding is based on the collective presence of hydric soil, wetland hydrology, and wetland vegetation indicators. The identified palustrine emergent wetlands contained low chroma soils, evidence of wetland hydrology and vegetation adapted for life in saturated soil conditions. The 0.15 acres of vegetated wetlands on the project site are palustrine emergent seasonal wetlands and palustrine scrub-shrub wetlands per Cowardin et al. (1979) criteria. The wetlands mapped on site consist of areas located within the three drainages found on the property. The 0.15 acres of jurisdictional waters of the US serve the functions of flood flow alteration, groundwater recharge, sediment reconstruction, sediment/toxicant retention, nutrient removal/ transformation, production export, and wildlife habitat.

Aquatic resources within the Study Area and adjacent to the Study Area were examined with respect to the *Solid Waste Agency of Northern Cook County* (*SWANCC) v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) exclusion from Clean Water Act regulation. No areas were found that could either potentially be exempted or excluded from regulation in accordance with SWANNC. HBG has also reviewed the wetlands with respect to the *Rapanos v. United States* and *Carabell v. United States* 547 U.S. 715 (2006) and found the areas in question to be jurisdictional pursuant to the Corps criteria.

The wetland map was verified by the Sacramento District of the Corps of Engineers on June 14, 2016. Three areas of jurisdictional wetland have been verified on the property. These are noted in Figure 8 as Wetland Swale (WS)-1, WS-2 and WS-3 and are described below with information contained the wetland delineation report (Salix Consulting 2016).

- WS-1 (0.12 acres) occurs within the foothill woodland habitat. The swale begins in the middle of the study area, where it collects surface water (in the form of sheet flow) and then drains westerly, where it then exits the study area through a culvert underneath Sierra College Boulevard. The swale then continues west to culvert adjacent to Sierra College Boulevard.

- WS-2 (0.01 acres) enters the study area through a culvert along the eastern boundary in the northeast corner of the study area. The swale appears to convey stormwater runoff and urban water westerly for approximately 80 feet within the study area, and then exits the study area through a culvert underneath Starlight Lane.

- WS-3 (0.02 acres) occurs in the southwestern corner of the study area, where stormwater runoff drains onto the study area through an 18-inch PVC culvert located on the commercial development (McDonald's/Chevron) to the south. The swale continues

for approximately 175 feet west until it merges with a narrower excavated ditch that drains water from a 12-inch concrete culvert located under the commercial development to the south. Water exits the study area along the western boundary through a 30-inch corrugated metal pipe culvert under Sierra College Boulevard.

3.2.4 Special Status Species

Sensitive species include those species listed by the federal and state governments as endangered, threatened, or rare or candidate species for these lists. Endangered or threatened species are protected by the federal Endangered Species Act of 1973 as amended, the California Native Plant Protection Act of 1977, and the California Endangered Species Act of 1970. The California Environmental Quality Act (CEQA) provides additional protection for unlisted species that meet the "rare" or "endangered" criteria defined in Title 14, California Code of Regulations, Section 15380.

The CDFW maintains records for the distribution and known occurrences of sensitive species and habitats in the California Natural Diversity Database (CNDDB). The CNDDB is organized into map areas based on 7.5 minute topographic maps produced by the U.S. Geological Survey (USGS). All known occurrences of sensitive species and important natural communities are mapped onto the quadrangle map. The database gives further detailed information on each occurrence, including specific location of the individual, population, or habitat (if possible) and the presumed current state of the population or habitat. The Project Site is in the Rocklin 7.5-minute USGS topographic quadrangle map. The relevant adjacent quads within the search area are the Roseville, Lincoln, Gold Hill, Auburn, Pilot Hill, Folsom, and Citrus Heights quadrangles. HBG collected all information contained within the CNDDB regarding special status species within a 10-mile radius of the Project Site.

A search of the CNDDB records of occurrence for special status animals and plants and natural communities within these quadrangles indicated that none have been documented as occurring on the Project Site itself, but that a number of special status animal species have been known to occur in the project vicinity. The absence of a special animal, plant, or natural community from the report does not necessarily mean they are absent from the area in question, but only that no occurrence data have been entered for that species or natural community in the CNDDB inventory. The occurrence of special status plant and animal species near the project area may be an indication that they also could occur at the Project Site, depending on habitat conditions at the site. Therefore, occurrences of special status species throughout the quadrangles mentioned above were noted in considering the potential presence of these species on the Project Site.

An evaluation of all special status plant species reported near the Project Site is presented in Table 3 (Attachment 2). Table 4 presents an evaluation of special status animal species that have been reported near the project.

Special Status Plant Species
Special status plant species include: (i) species that are listed or proposed for listing as threatened or endangered under the federal Endangered Species Act; (ii) species that are listed, or proposed for listing by the state of California as threatened or endangered under the California Endangered Species Act; (iii) plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered in California and elsewhere; and (iv) plant species that meet the definition of rare or endangered under CEQA.

A target list of special status plants found within 10 miles of the site is shown in Table 3 that includes all species mentioned in the CNDDB occurring within 10 miles of the project site. Many of the species mentioned in the CNDDB as occurring within 10 miles of the project require habitats that are not found on the Project (e.g., vernal pools, chaparral, coniferous forest) or microhabitat conditions such as soils that do not occur on the property (gabbro or serpentine). Based on field review of the habitats and conditions occurring on the site, HBG has determined that several species are possible at the Project Site. These species are listed below along with their flowering periods (Munz and Keck 1973).

- Big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis*) a CNPS List 1B.2 plant, that is sometimes, but not always found in serpentine. Flowering period from March to June.
- Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*), a CNPS List 4.2 plant. Flowering period from May to July.
- Stinkbells (*Fritillaria agrestis*), a CNPS List 4.2 plant, that is sometimes, but not always found in serpentine. Flowering period from March to June.

A systematic survey of the site for special status plant species is planned for the spring and summer of 2017. Dr. Terry Huffman, Ph.D. botanist, will conduct systematic surveys both early and late in the flowering period of target species. Surveys will be conducted between late-March and late-June.

Special Status Animal Species
The special status animal species evaluated in Table 4 (Attachment 2) include those noted in the CNDDB as occurring within 10 miles of the site and those that are known to occur in the general vicinity based on the knowledge of HBG biologists. Key species are either known to occur in the vicinity of the property or with a potential to occur at the site, or that require specific study to determine presence/absence, are discussed below.

HBG has consulted the CDFW California Natural Diversity Data Base (CNDDB) to ascertain the potential for special status animal species occurring within the 7.5-minute quadrangle map areas in the project site vicinity. The CNDDB indicates that seven special status species deserve note as having occurred within the 10-mile radius of the site: vernal pool fairy shrimp (*Branchinecta lynchi*), California linderiella (*Linderiella occidentalis*), Steelhead-Central Valley DPS *(Oncorhynchus mykiss irideus),* Western spadefoot toad (*Spea hammondii*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*) and tricolored blackbird *(Agelaius*

tricolor). These species are discussed below. Other species found to occur within the general CNDDB search area, or determined to be potentially present based on the knowledge of the investigators, are evaluated in Table 4.

HBG wildlife biologist Gary Deghi conducted a variety of special status species surveys and habitat assessments on the project site during a field visit conducted on February 11, 2017. The field work included an evaluation of wetlands swales areas for suitability to support the vernal pool fairy shrimp, vernal pool tadpole shrimp and western spadefoot toad. Gary Deghi of HBG also conducted habitat evaluations related to other special status species including possible use of the site by special status raptors (including Swainson's hawk, burrowing owl, white-tailed kite and others) and other special status species such as Western pond turtle, tricolored blackbird and loggerhead shrike.

Listed Vernal Pool Large Branchiopods

The two most common of the large branchiopods occurring in the Central Valley, that are listed under the federal Endangered Species Act, are the threatened vernal pool fairy shrimp (VPFS, *Branchinecta lynchi*) and endangered vernal pool tadpole shrimp (VPTS, *Lepidurus packardi*). These large branchiopods are ephemeral creatures. When the temporary water bodies that they inhabit dry up, the population remains in the dry basin as cysts (embryonic eggs). These cysts can withstand harsh conditions (i.e., freezing and desiccation) while they await the return of rain to fill their pools. After the appropriate environmental conditions (i.e., water temperature, pH, oxygen concentration, etc.) prevail, the young hatch, quickly mature, and then mate to ensure the next generation.

Potential habitat for listed large branchiopods is considered any seasonally-inundated depression that on average ponds water at a sufficient depth and duration for a listed branchiopod to complete its lifecycle. Potential habitat for the VPFS and VPTS are defined as any seasonal inundated depression that on average ponds water 2.0 inches or greater in depth for 14 or more consecutive days and 30 or more consecutive days, respectively.
Generally, these habitats occur within the California Floristic Province at elevations below 5,600 feet in Coast Range and below 3,000 feet elevations for the rest of the State and Oregon. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages) or semi-to-permanently inundated areas that support perennial population of predators (e.g. bullfrogs, fish, and crayfish) are generally not considered suitable habitat for federally listed large branchiopods.

The records search of the CNDDB (CDFW 2017) revealed occurrences of the VPFS or VPTS within vernal pool landscapes as close at about 3 miles to the south and west of the Project Site. It was determined that the seasonal swales at the Project Site were flowing-water systems of insufficient depth that do not exhibit the characteristics that would accommodate use of the site by either of these listed species of vernal pool crustacean.

California Linderiella

The California linderiella (*Linderiella occidentalis*), also known as the California fairy shrimp, is

not listed by the federal ESA or CESA, but was at one time a federal species of concern and is listed by the International Union for the Conservation of Nature (IUCN) as a species threatened with extinction. It is generally found in the same types of aquatic habitats as vernal pool fairy shrimp and frequently co-occurs with this species. This species tends to live in large, fairly clear vernal pools and lakes. However, they can survive in clear to turbid water with a pH from 6.1 to 8.5, and they have also been found in very small pools. They are tolerant of water temperatures from 41 degrees to 85 degrees F, making them the most heat tolerant fairy shrimp in California. The California fairy shrimp is the most common fairy shrimp in the Central Valley. It has been documented in most land forms, geologic formations and soil types supporting vernal pools in California, at altitudes as high as 3800 feet above sea level. The range extends from Shasta County south to Fresno County and across the valley to the coast and Transverse Ranges from Willits in Mendocino County south to near Sulfur Mountain in Ventura County.

The CNDDB documents that California linderiella have occurred in vernal pool landscapes as near as two miles south of the Project Site. None of the seasonal wetlands found on the Project Site have inundation characteristics making them suitable to support California linderiella.

Steelhead- Central Valley DPS

Central Valley steelhead was originally listed in 1998 as a threatened species and the listing was reconfirmed in January of 2005. The Central Valley Distinct Population Segment (DPS) includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco Bay and San Pablo Bays and their tributaries. Central Valley steelhead spawn and rear, or have the potential to spawn and rear, in western Placer County streams, including Coon Creek, Doty Ravine, Auburn Ravine, Secret Ravine, and Miners Ravine. In the project area, Central Valley steelhead are found in Dry Creek and its tributaries in Secret Ravine and Miners Ravine, located about four miles southwest of the Project Site.

Steelhead are anadromous, but some individuals may complete their life cycle within a given river reach. Historical records indicate that adult steelhead enter the mainstem of the Sacramento River in July, peak in abundance in September and October, and continue migrating through February or March. Most steelhead spawn from December through April, with the most spawning occurring from January through March. Unlike Pacific salmon, some steelhead may survive to spawn more than once, returning to the ocean between spawning migrations. Juvenile migration to the ocean generally occurs from December through August. Most Sacramento River steelhead migrate in spring and early summer. After 2 to 3 years of ocean residence, adult steelhead return to their natal stream to spawn as 3- or 4-year-olds.

Local populations of Central Valley steelhead are found in Dry Creek and its tributaries, most notably in Secret Ravine and Miners Ravine. The CNDDB (CDFW 2017) reports that the mainstem of Dry Creek is used by the fish as a migratory corridor as the water quality and substrate are too degraded so support spawning. Spawning and rearing habitat is found in tributaries upstream from Dry Creek, including both Secret Ravine and Miners Ravine, which are located about four miles southwest of the Project Site. Electrofishing surveys conducted in

2004 caught 136 steelhead in Secret Ravine and evidence of spawning was also reported in 2007. Cottonwood Dam was a barrier to fish passage in Miners Ravine until the dam's collapse in 2009.

Western Spadefoot Toad

The western spadefoot toad (*Scaphiopus hammondi*i) is a state-designated species of special concern that is known from the Central Valley and adjacent foothills, and from the coast ranges south of San Francisco Bay to Baja California. Western spadefoot toads require presence of an aquatic habitat for breeding and a terrestrial habitat for feeding and aestivation. Western spadefoot toads are mostly terrestrial, using upland habitats to feed and burrow in for their long dry-season dormancy. The species primarily occurs in grasslands habitat, typically near extensive areas of friable soils (but usually not sandy), but can occur in valley-foothill woodlands, coastal scrub and chaparral communities below 3,000 ft. elevation.

The western spadefoot toad requires seasonally-inundated wetlands for reproduction and metamorphosis, but have been known to utilize slow-mowing waters and pools within washes, river floodplains, alluvial fans, alkali lakes and playas. They mate during the rainy season (generally from January to March), usually after heavy rains. Potential western spadefoot toad breeding habitat includes any seasonally to semi-permanently inundated depression that on average ponds water at a sufficient depth and duration for a toad to complete its lifecycle (eggs to metamorphous) which occurs in the known range of the species. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages) or support populations of predators (e.g. bullfrogs, fish, crayfish) are generally not considered suitable habitat for western spadefoot toad larvae.

The CNDDB reports occurrences of western spadefoot toad in suitable habitat approximately 3.5 miles southwest of the Project Site. A review of habitat conditions found on the site during field studies conducted on February 11, 2017 revealed that the seasonal swales are flowing streams of insufficient depth and duration to support the western spadefoot toad.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is a medium-sized hawk that is state-listed in California as threatened species and designated by the USFWS as a Bird Species of Conservation Concern. Most Swainson's hawk territories in the Central Valley are in riparian systems adjacent to suitable foraging habitats. Valley oak, Fremont cottonwood, walnut and large willows with an average height of about 58 feet, and ranging from 41 to 82 feet, are the most commonly used nest trees in the Central Valley (CDFG 2007), but eucalyptus is also commonly used. Swainson's hawks often nest peripherally to riparian systems of the valley as well as utilizing lone trees or groves of trees in agricultural fields. Suitable foraging areas include grasslands, pastures, alfalfa and other hay crops, and certain grain and row croplands. In the Central Valley, Swainson's hawks find suitable foraging habitat in such agricultural areas near suitable nest sites, however, nesting habitat is in decline due primarily to flood control projects, agricultural practices, and urban development. The current population of Swainson's hawk in California's Central Valley is estimated at 1,948 breeding pairs (CDFW 2007), with most of this population occurring in the

area from Stanislaus County north to Butte County.

The nearest documentation of nesting Swainson's hawk is about 7 miles west of the Project Site, according to the CNDDB. Swainson's hawk is much more likely to nest in trees near riparian habitats or agricultural fields on the Valley floor rather than in oak woodland in the foothills, such as found at the Project Site. Use of the Project Site by this species is probably limited to occasional visits while foraging. Nevertheless, spring surveys of the site planned by an HBG wildlife biologist between late-April and May of 2017 will include searches for this species.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is a state species of special concern and designated by the USFWS as a Bird Species of Conservation Concern. Burrowing owls are small terrestrial owls commonly found in open grassland topography ranging from western Canada to portions of South America. Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. In California, burrowing owls most commonly use ground squirrel burrows, but they also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers during migration. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance.

The nearest report of burrowing owl in the CNDDB is more than eight miles west of the site. A survey of the project area was conducted by HBG wildlife biologist Gary Deghi during the February 11, 2017 site visit, and no burrowing owls were observed. The site is also lacking in colonies of California ground squirrels that are the most common burrow occupied by burrowing owl. In addition, habitat at the Project Site was found to be unsuitable to support burrowing owl, as heights of herbaceous plants and grasses throughout the onsite uplands were too high to support foraging by this species. Based on these findings, it is very unlikely that burrowing owl occurs on the Project Site. In addition, no California ground squirrels or their burrows were observed anywhere on the site during field review, indicating that presence of burrowing owl on the property is extremely unlikely. Nevertheless, spring surveys of the site planned by an HBG wildlife biologist between late-April and May of 2017 will include searches for this species.

Tricolored Blackbird

Tricolored blackbird (*Agelaius tricolor*) is a Candidate for listing as Endangered under CESA and is also designated by the USFWS as a Bird Species of Conservation Concern. Commencing on December 29, 2014, tricolored blackbird nesting colonies were given a six-month emergency listing as an endangered species under the California Endangered Species Act. Tricolored blackbird is a highly colonial nesting species that breeds near freshwater, preferably in emergent wetlands with tall, dense growth of cattails or tules. Even when the preferred nesting substrates are available, other vegetation may be used for nesting including sedges, nettles,

willows, thistles, mustard, blackberry, wild rose, foxtail grass or barley. Since the 1970s with declines in populations, nesting in cereal crops and dairy silage has been documented. Tricolored blackbird foraging areas include rangeland, fields of alfalfa or cut hay, or irrigated pastures with an abundance of insects. No areas of the Project Site provide suitable habitat for a nesting colony of tricolored blackbird, nor do onsite habitats provide foraging habitat for the species.

Special Status Raptor Species- Six raptor species designated with special status by the State of California have a small potential to nest at the site. These species include ground-nesting species: burrowing owl (State Species of Special Concern and Federal Bird Species of Conservation Concern), and Northern harrier (State Species of Special Concern and Federal Bird Species of Conservation Concern); and tree nesting species: white-tailed kite (California Fully Protected), Cooper's hawk (California Watch List Species), Sharp-shinned hawk (California Watch List Species) and Swainson's hawk (state-listed threatened).

Three raptor species that could occur are designated as state species of special concern based on presence of wintering habitat (ferruginous hawk, golden eagle, and merlin). These species are wide-ranging species often wintering over a broad area, and incidental use of the site by any these species in winter is certainly possible. The site, however, contains no unique habitat features that would highlight the importance of the site as a wintering location for any of these species.

3.2.5 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act conserves and manages the fishery resources found off the coasts of the United States, the anadromous species, and the Continental Shelf fishery resources of the United States, including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The National Marine Fisheries Service (NMFS) enforces the Magnuson-Stevens Fishery Conservation and Management Act and regulates commercial and recreational fishing and the management of fisheries resources. Consultation with NOAA Fisheries is required for all projects with the potential to affect EFH for any MSA species. Central Valley fall/late fall–run Chinook salmon is a Magnuson-Stevens Fishery Conservation and Management Act managed species.

In the Central Valley, fall/late fall–run Chinook historically spawned in all major streams draining the Sierra Nevada, but fish passage has since been blocked by dams. Currently, fall/late fall–run Chinook salmon compose about 80% of the total Chinook salmon produced in the Sacramento and San Joaquin drainages. Fall/late fall–run Chinook salmon spawn in the Sacramento and San Joaquin Rivers and most of their tributaries. Central Valley fall/late fall–run Chinook salmon spawn and rear, or have the potential to spawn and rear, in western Placer County streams including Bear River, Coon Creek, Doty Ravine, Auburn Ravine, Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Jones and Stokes 2005). Antelope Creek, Secret Ravine and Miners Ravine may be considered as Essential Fish Habitat

(EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of Central Valley fall/late fall–run Chinook salmon.

4.0 REGULATORY AGENCIES AND POLICIES

The following is a description of federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

FEDERAL

Clean Water Act-Section 404

The U.S. Army Corps of Engineers regulates discharges of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into Waters of the U.S., including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. §328.2(f)). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency are responsible for implementing the Section 404 program. Section 404(a) authorizes the Corps to issue permits, after notice and opportunity for comment, for discharges of dredged or fill material into waters of United States. Section 404(b) requires that the Corps issue permits in compliance with EPA guidelines, which are known as the Section 404(b)(1) Guidelines. Specifically, the Section 404(b) (1) guidelines require that the Corps only authorize the "least environmentally damaging practicable alternative" (LEDPA) and include all practicable measures to avoid and minimize impacts to the aquatic ecosystem. The guidelines also prohibit discharges that would cause significant degradation of the aquatic environment or violate state water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 C.F.R. §328.3(b)).

Furthermore, Jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 C.F.R. §328.3(e)).

Tidal waters are also under the jurisdiction of the Corps. The landward limits of jurisdiction in tidal waters extend to the high tide line…"or, when adjacent non-tidal waters of the United States are present, to the limits of jurisdiction for such non-tidal waters" (33 C.F.R.§328.4(b)) High tide is further defined to include the line reached by spring high tides and other high tides that occur with periodic frequency (33 C.F.R.§328.3(d)).

All wetlands at the Project Site were reviewed to determine if they could be disclaimed from Corps jurisdiction as isolated wetlands following two recent US Supreme Court decisions. In *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (SWANCC), No. 99-1178 (2001),* some isolated wetlands may be excluded from the Corps' Section 404 jurisdiction because they are (1) non-tidal, (2) non-navigable, (3) not hydrologically connected to navigable waters or adjacent to such waters, and (4) not subject to foreign or interstate commerce.

Subsequent to SWANCC, the U.S. Supreme Court decided on *Rapanos v. United States* and *Carabell v. United States*, 126 U.S. 2208 (2006) (herein referred to as Rapanos). In 2007, guidance was given to EPA regions and Corps districts to implement the Supreme Court's decision which addresses the jurisdiction over waters of the U.S. under the Clean Water Act. The Rapanos guidance requires the Corps to conduct detailed analysis of the functions and values of wetlands and other waters of the U.S. potentially onsite and in some cases offsite, determine if there is a nexus to traditional navigable waters and the significance of the nexus to the traditional navigable water. Neither the Court nor the recently-issued guidance draw a clear line regarding the geographic reach of jurisdiction, particularly in drainages where flows are ephemeral and where wetlands are adjacent to but not directly abutting relatively permanent water, such as the wetlands delineated on the study site.

The guidance includes requirements for additional documentation, particularly regarding whether there is a "significant nexus" to a traditionally-navigable water (TNW). For water bodies that are traditionally navigable (and their adjacent wetlands), and for tributaries that are "relatively permanent waters" (RPW's: streams that are not perennial but that flow for 3 months or more annually, and their adjacent wetlands that directly abut the RPW's), the Corps and EPA will assert jurisdiction under the Clean Water Act, without the need for any exhaustive documentation of "significant nexus." There is no dispute that Clean Water Act jurisdiction encompasses traditionally-navigable waters and their perennial and relatively-permanent tributaries. Activities that result in discharges of pollutants into these waters can adversely affect the physical, chemical, and biological integrity of navigable waters.

For wetlands adjacent to but not directly abutting a RPW, jurisdiction may be asserted under the Clean Water Act if there is a "significant nexus" and for tributaries that typically do not flow more 3 months or more annually, and if there are adjacent wetlands associated with these non-relatively permanent waters (non-RPW's), jurisdiction may be asserted under the Clean Water Act if there is a "significant nexus." A significant nexus analysis, using the Corps' approved jurisdictional determination form, "will assess the flow characteristics and functions of the

tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW." These factors include (a) the capacity to carry pollutants or flood water into a TNW; (b) the capacity to provide habitat for species that are present in the downstream TNW; (c) the capacity of transferring nutrients and organic carbon to a TNW; or (d) other "relationships to the physical, chemical, or biological integrity of the TNW.

Clean Water Act-NPDES Requirements

In 1972, the Clean Water Act was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollution Discharge Elimination System (NPDES) permit. The 1987 amendments established a framework for regulating municipal, industrial, and construction-related storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that establish storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water from construction projects that encompass one or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. The California State Water Resource Control Board has developed a general construction storm water permit to implement this requirement.

Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend. The FESA establishes an official listing process for plants and animals considered to be in danger of extinction; requires development of specific plans of action for the recovery of listed species; and restricts activities perceived to harm or kill listed species or affect critical habitat (16 USC 1532, 1536).

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3) Taking can result in civil or criminal penalties. Federal regulation 50 CFR 17.3 further defines the term harm in the take definition to mean any act that kills or injures a federally listed species, including significant habitat modification or degradation. Additionally, FESA prohibits the destruction or adverse modification of designated critical habitat. In the Service's regulations at 50 CFR 402.2, destruction or adverse modification is defined as a "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species.

The ESA also requires federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat (16 USC 1536). Therefore, the ESA is invoked when the property contains a federally listed threatened or

endangered species that may be affected by a permit decision. In the event that listed species are involved and a Corps permit is required for impacts to jurisdictional waters, the Corps must initiate consultation with USFWS (or the National Marine Fisheries Service, NMFS) pursuant to Section 7 of the ESA (16 USC 1536; 40 CFR § 402). If formal consultation is required, USFWS or NMFS will issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species, recommending reasonable and prudent measures to ensure the continued existence of the species, establishing terms and conditions under which the project may proceed, and authorizing incidental take of the species.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFA) conserves and manages the fishery resources found off the coasts of the United States, the anadromous species, and the Continental Shelf fishery resources of the United States, including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The NMFS enforces the MSFA and regulates commercial and recreational fishing and the management of fisheries resources. The Sustainable Fisheries Act of 1996 amended the MSFA to include new fisheries conservation provisions by emphasizing the importance of fish habitat in regards to the overall productivity and sustainability of U.S. marine fisheries (Public Law 104-267). The revised MSFA mandates the identification and protection of Essential Fish Habitat (EFH) for managed species during the review of projects conducted under federal permits that have the potential to affect such habitat. Federal agencies are required to consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency, which may adversely affect EFH (MSFA 305.b.2).

Under the MSFA, NMFS identifies, conserves, and enhances EFH for those species regulated under a federal fisheries management plan (FMP). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity and includes all associated physical, chemical and biological properties of aquatic habitat that are used by fish. Projects that have the potential to adversely affect EFH must initiate consultation with NMFS. Adverse effects are any impacts that reduce the quality and/or quantity of EFH and can include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). There are four FMPs in California, Oregon, and Washington that identify EFH for groundfish, coastal pelagic species, Pacific salmon, and Pacific highly migratory fisheries.

Central Valley fall/late fall–run Chinook salmon is a Magnuson-Stevens Fishery Conservation and Management Act managed species. This species either spawns of has the potential to spawn in western Placer County streams, that near the project include Antelope Creek, Secret Ravine, and Miners Ravine, which would be considered as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of Central Valley fall/late fall–run Chinook salmon.

Migratory Bird Treaty Act
The federal Migratory Bird Treaty Act is administered by the USFWS. The Act provides that it is unlawful to: pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product unless permitted by regulations. Most bird species within California fall under the provisions of the Act. Excluded species include nonnative species such as house sparrow, starling, and ring-necked pheasant and native game species such as quail.

Fish and Wildlife Coordination Act
The USFWS also has responsibility for project review under the Fish and Wildlife Coordination Act. This statute requires that all federal agencies consult with USFWS, NMFS, and the state's wildlife agency (California Department of Fish and Wildlife, CDFW) for activities that affect, control, or modify streams and other water bodies. Under the authority of the Fish and Wildlife Coordination Act, USFWS, NMFS, and CDFW review applications for permits issued under Section 404 and provide comments to the Corps about potential environmental impacts.

STATE

California Endangered Species Act
The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state-listed endangered and threatened species. CESA requires state agencies to consult with the California Department of Fish and Wildlife (CDFW) when preparing California Environmental Quality Act (CEQA) documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that 'overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The CESA prohibits the taking of state-listed endangered or threatened plant and wildlife species. CDFW exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFW may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFW requires preparation of mitigation plans in accordance with published guidelines.

Section 401 of the Federal Clean Water Act/Porter Cologne Water Quality Act

Pursuant to section 401 of the Federal Clean Water Act, projects that require a Corps permit for the discharge of dredge or fill material must obtain water quality certification that confirms a project complies with state water quality standards before the Corps permit is valid. State

water quality is regulated/administered by the State Water Resources Control Board and its nine Regional Water Quality Control Boards (RWQCB). The state also maintains independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Act.

The California State Water Resource Control Board has developed a general construction storm water permit to implement the requirements for the federal National Pollution Discharge Elimination System (NPDES) permit. The permit requires submittal of a Notice of Intent to comply, fees, and the implementation of a Storm Water Pollution Prevention Plan.

CDFW Species of Special Concern

CDFW tracks species in California whose numbers, reproductive success, or habitat may be threatened. Even though not formally listed under FESA or CESA, such plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFW. CDFW has also designated special-status natural communities which are considered rare in the region, support special status species or otherwise receive some form of regulatory protection. Documentation pertaining to these communities, as well as special status species (including species of special concern), is kept by CDFW as part of the CNDDB.

Natural Community Conservation Planning Act

The Natural Communities Conservation Planning Act (NCCP) program, which began in 1991 under the California Natural Community Conservation Planning Act, is broader in its orientation and objectives than CESA and ESA; these laws are designed to identify and protect individual species that are already listed as threatened or endangered and their habitats. The primary objective of the NCCP program is to conserve natural communities at the ecosystem scale while accommodating compatible land use.

Placer County is currently involved in efforts to prepare the Placer County Conservation Plan, a Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan (NCCP) that may eventually be applicable to projects in the Loomis area. A draft of the HCP/NCCP has not been developed as of the date of this report.

California Department of Fish and Wildlife-Streambed Alteration Agreement

Section 1602 of the California Fish and Game Code requires any person, governmental agency, or public utility proposing any activity that will divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposing to use any material from a streambed, to first notify CDFW of such proposed activity. CDFW may propose reasonable modifications, based on the information contained in the notification form and a possible field inspection, CDFW may propose reasonable modifications in the proposed construction as would allow for the protection of fish and wildlife resources. Upon request, the parties may meet to discuss the modifications. If the parties cannot agree and execute a Lake and Streambed Alteration Agreement, then the matter may be referred to arbitration.

California Department of Fish and Wildlife Fish and Game Code 3503 and 3503.5
Section 3503 of the Fish and Game Code makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird. Section 3503.5 makes it unlawful to take or possess birds of prey (hawks, eagles, vultures, owls) or destroy their nests or eggs.

California Department of Fish and Wildlife Fully Protected Animal Species
The classification of Fully Protected was an effort by the State of California in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Most Fully-Protected species have also been listed as threatened or endangered species under state endangered species laws and regulations. Species classified as Fully Protected Species by the CDFW may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock (as per California Fish and Game Code Section 3511(a)(1)).

Public Resources Code Section 21084.4 for Oak Woodlands Conservation
As of January 2005, Public Resources Code Section 21083.4 requires California Counties acting as Lead Agencies under CEQA to determine whether a project "may result in a conversion of oak woodlands that will have a significant effect on the environment." If individual or cumulative impacts to oak woodlands are identified, the law requires that the impacts be mitigated. Acceptable mitigation measures include, but are not limited to, conservation of other oak woodlands through the use of conservation easements, planting replacement trees which must be maintained for seven years, contribution to the Oak Woodland Conservation Fund established under Section 1363(a) of the Fish and Game Code, or other measures.

LOCAL

Placer County General Plan
In addition to federal and state regulations, the development of the property must be accomplished consistent with the land use designations and natural resource and other policies of the Placer County General Plan.

OTHER STATUTES, CODES, AND POLICIES AFFORDING LIMITIED PROTECTION

California Native Plant Society
The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of California (CNPS 2014: https://www.cnps.org/cnps/rareplants/inventory/). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings: https://www.cnps.org/cnps/rareplants/ranking.php

California Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere.

California Rare Plant Rank1B: Plants rare, threatened, or endangered in California and elsewhere.
California Rare Plant Rank 2A: Plants presumed extirpated in California, but more common elsewhere.
California Rare Plant Rank 2B: Plants rare, threatened, or endangered in California, but more numerous elsewhere.
California Rare Plant Rank 3: Plants about which more information is needed – a review list.
California Rare Plant Rank 4: Plants of limited distribution – a watch list.

5.0 IMPACTS AND MITIGATION MEASURES

5.1 Standards of Significance

According to the Environmental Checklist in Appendix G of the CEQA Guidelines (Title 14, California Code of Regulations, 15000 et seq.), the project would be considered to have a significant impact on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Wildlife and Game or U.S. Fish and Wildlife Service.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.2 Relevant Project Characteristics

Costco Wholesale is proposing to construct Costco warehouse facility on the property. A plan view of conceptual design for the configuration of proposed project can be seen in Figure 4. The facility includes the Costco warehouse and associated parking and other infrastructure. The proposed project would cover the entire site.

5.3 Impacts and Mitigation Measures

5.3.1 Plant Communities and Vegetation

Impacts to biological resources will result from vegetation removal due to the conversion of upland areas composed of Annual Grassland, Valley Oak Woodland and Valley Freshwater Marsh to accommodate the proposed Costco facility. The acreage of each of the vegetation

communities found on the property, and impacts resulting from site development as planned are shown in Table A. Figure 9 shows the development footprint as an overlay of the vegetation communities found on the project site. The footprint for the proposed project would cover 100% of the site.

TABLE A. IMPACTS TO VEGETATION COMMUNITIES

Habitat Type	Existing Acreage in Overall Study Area (acres)	Impacted Acreage (acres)
Annual Grassland	10.16	10.16
Valley Freshwater Marsh	0.15	0.15
Valley Oak Woodland	7.96	7.96
TOTAL	**18.27**	**18.27**

Wetlands and Waters of the U.S.

Wetlands and waters of the U.S. are regulated by state and federal agencies and would be considered sensitive natural communities as defined by CEQA. Impacts to waters of the U.S. would be potentially significant if appropriate mitigation was not implemented for all regulated wetlands as required by state and federal regulations.

The ecological constraints to development at the site include approximately 0.15 acres of wetlands and waters of the U.S. potentially subject to Corps jurisdiction pursuant to Section 404 of the Federal Clean Water Act as shown in Figure 8. As the palustrine emergent wetlands are located in various portions of the site, complete avoidance of jurisdictional wetlands would not be possible. Impacts to wetlands and waters of the U.S. potentially subject to Corps jurisdiction are shown in Figure 10. The development plan for the site would permanently impact 0.15 acres of palustrine emergent wetlands located on the site that are potentially under the jurisdiction of the Corps under Clean Water Act Section 404. Without mitigation, project impacts to wetlands or waters of the U.S. would be significant.

Impact 1: Direct (fill) impacts to 0.15 acres of waters of the U.S. would result from implementation of the proposed Costco warehouse facility.

> **Mitigation Measure 1:** The developer will submit applications for a Nationwide permit from the Corps of Engineers (see Section 4.5, Permit Requirements), and Section 401 water quality certification from the Central Valley Regional Water Quality Control Board (RWQCB), required for the Corps permit to be valid. Appropriate wetland mitigation would be required by the Corps and RWQCB for impacts to the 0.15 acres of seasonal wetlands located at the site, and a wetland mitigation plan to mitigate impacts to jurisdictional areas would need to be developed as part of the Corps and RWQCB permit

process. Corps jurisdictional areas must be replaced at a minimum 1:1 ratio through wetland creation (preferably on-site) to ensure that no net loss of acreage or functions and values to these areas occurs. Options for providing mitigation include creation of wetlands on site or contributions to an agency-approved wetland mitigation bank. As the footprint of the proposed project requires use of most, if not all, of the site, the preferred method of mitigation is through contributions to an agency-approved mitigation bank.

Oak Woodlands

Project construction would result in the loss of approximately 7.96 acres of Valley Oak Woodland habitat on the site (see Figure 9). Tree removal and impact to oak woodland habitat was assumed within the graded footprint of the project, and included all trees on the property.

Mann Made Resources (see Attachment 3) determined that the project would result in the removal of 372 trees determined to be of protected size. Of these 372 trees, 162 were found to be in good and fair condition for a total mitigation planting requirement of potentially 290 #15 container trees. It should be possible to plant these trees on the property as part of the project landscape design and parking lot shade.

Oaks woodlands provide significant wildlife habitat value. Oak woodlands are protected by the California Department of Fish and Game, State of California regulations including Public Resources Code Section 21083.4, and policies of the Town of Loomis. Public Resources Code Section 21083.4 directs Counties to mitigate significant effects of oak woodland conversion, and would not apply to a project reviewed by the Town of Loomis as a CEQA Lead Agency.

Impact 2: The project would require construction within 7.96 acres of Valley Oak Woodland habitat and the direct removal of 372 mature trees determined to be of protected size.

> **Mitigation Measure 2:** The applicant should prepare an Oak Woodland Tree Replacement and Protection Plan including: (i) planting of 290 #15 container trees as recommended by the arborist to attain tree replacement ratios prescribed by the Town of Loomis; (ii) the specific location of the tree planting, (including a map and planting plan); (iii) schedules and methodologies for maintaining and monitoring the success of the Plan; and (iv) performance standards.

Landscaping/Invasive Species

Invasive, exotic weeds compete with native vegetation and can degrade the quality of wildlife habitats. Project landscaping and construction activity has the potential to introduce invasive, exotic, non-native vegetation, some of which may not now exist in the area. Also, highways and various construction projects provide a pathway for dispersal of invasive plants. Invasive plant species include those designated as noxious weeds by the U.S. Department of Agriculture, problem species listed by the California Department of Food and Agriculture, and other invasive plants designated by the California Invasive Plant Council. Where appropriate, vegetation removed because of project activities should be replaced with native species which are of value

to local wildlife. Native plants generally are more valuable as wildlife food sources and require less irrigation, fertilizers, and pesticides than exotic species.

Impact 3: Project landscaping is expected to introduce exotic, non-native vegetation, some of which may not exist in the area.

> **Mitigation Measure 3:** Landscaping should be designed to enhance the wildlife value and aesthetic quality of undeveloped portions of the project site. Where appropriate, vegetation removed because of project activities should be replaced with native species which are of value to local wildlife, and native vegetation should be retained. Weed management practices may be warranted, including identification and removal of infestations of noxious weeds prior to construction, use of construction equipment and materials such as fill and erosion control devices that are known to be weed-free, power-washing of construction vehicles to remove mud, dirt and vegetative material before working in relatively weed-free areas, and removal of invasive species from undeveloped areas within the project boundary.

5.3.2 Animal Species

Loss of vegetation associated with the habitats on site will disrupt and displace existing wildlife. Some bird roosting, nesting, and foraging areas will be eliminated. Reptiles, amphibians, and small mammals that utilize these areas will be displaced to remaining undisturbed areas. Open space areas near the project area should be capable of accommodating these species. Animal species that have adapted to living in close association with human disturbance can be expected to increase after the proposed project. These species include mammals such as raccoon, California ground squirrel, deer mouse, and house mouse, and birds such as rock pigeon, Eurasian-collared dove, American robin, European starling, house sparrow, Brewer's blackbird and brown-headed cowbird.

Nesting Birds

Nesting bird species protected by the federal Migratory Bird Treaty Act could be impacted during project construction. The removal of trees and shrubs during the February 1 to August 31 breeding season could result in mortality of nesting avian species if they are present. Therefore, preconstruction surveys should be conducted of the development area to determine if nesting is occurring. If nests are found, a construction plan would need to be developed that would allow successful nesting (fledging of young birds).

Many species of raptors (birds of prey) are sensitive to human incursion and construction activities. Therefore, to ensure that nesting raptor species are not present near the construction site, preconstruction surveys should include a thorough search for nesting raptor species, including raptor species of special status such as Swainson's hawk and burrowing owl, among others (see Mitigation Measure #7 below). Even though the Project Site does not contain suitable habitats for nesting by special status bird species such as tricolored blackbird and loggerhead shrike, preconstruction surveys should include searches for these species to

ensure nests of these species, if they were to found at the site, are not harmed.

Impact 4: The removal of vegetation during the February 1 to August 31 breeding season could result in mortality of nesting avian species if they are present.

> **Mitigation Measure 4:** If feasible, construction work should take place outside of the February 1 to August 31 breeding window for nesting birds. If construction is to be conducted during the breeding season, a qualified biologist should conduct a pre-construction breeding bird survey in areas of suitable habitat within 15 days prior to the onset of construction activity. If bird nests are found, appropriate buffer zones should be established around all active nests to protect nesting adults and their young from construction disturbance. Size of buffer zones should be determined in consultation with wildlife agency staff based on site conditions and species involved. Buffer zones should be maintained until it can be documented that either the nest has failed or the young have fledged. Preconstruction surveys should include appropriate survey for nesting species of raptor, including special status raptor species (see Mitigation Measure #7) and other avian species with special status and with a small chance of occurring on the Project Site, such as tricolored blackbird and loggerhead shrike.

Water Quality

Construction activities on the project site would involve disturbance and exposure of soils through grading and removal of vegetative cover, excavation to install supports for the solar array, and other activities. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could cause increased sedimentation and turbidity in surface waters outside of the Project Site, resulting in degradation of water quality. Water from the Project Site drains west toward the adjacent property and then into Sucker Ravine, which drains into Secret Ravine. Secret Ravine is a tributary of Miners Ravine, which ultimately reaches Dry Creek and then the American River.

Ground-disturbing activities could promote erosion and allow elevated levels of sediment to wash into downstream creeks, where potential impacts to fish and wildlife species would be possible. In the absence of water quality controls, indirect impacts to animal populations in wetlands and other aquatic habitats could result from the proposed project due to elevated contaminants in stormwater runoff. However, the requirement for the implementation of a Stormwater Pollution Prevention Plan (SWPPP), with identification of proper construction techniques and Best Management Practices (BMPs) will minimize adverse effects associated with these activities. Furthermore, standard techniques to control contaminants in stormwater such as oil and grease traps will be employed to mitigate water quality concerns.

Impact 5: Placement of fill and other ground disturbing activities could promote erosion and allow elevated levels of sediment to wash into downstream aquatic areas, potentially affecting fish and wildlife resources.

Mitigation Measure 5: Best Management Practices and all requirements as detailed in the Stormwater Pollution Prevention Plan shall be implemented to control erosion and migration of sediments off-site. Implementation of water quality controls shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. In addition, vegetation should only be cleared from the permitted construction footprint. Areas cleared of vegetation, pavement, or other substrates should be stabilized as quickly as possible to prevent erosion and runoff.

Essential Fish Habitat

Antelope Creek, Secret Ravine and Miners Ravine would be considered as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of Central Valley fall/late fall–run Chinook salmon. Secret Ravine and Miners Ravine are located about four miles southwest of the Project Site; runoff from the site drains over the adjacent property to the west and then into Sucker Ravine which drains into Secret Ravine. Portions of Antelope Creek run approximately 0.7 miles to the northwest of the Project Site, but drainage flow is not in the direction of the creek. An unnamed drainage located just north of the property is a tributary to Antelope Creek.

In the absence of water quality controls, indirect impacts to EFH for Central Valley fall/late fall-run Chinook salmon could result from the proposed project due to elevated contaminants in stormwater runoff that eventually flow into Secret Ravine. However, the requirement for the implementation of a Stormwater Pollution Prevention Plan (SWPPP), with identification of proper construction techniques and Best Management Practices (BMPs) will minimize adverse effects associated with these activities (see Mitigation Measure 5). Furthermore, standard techniques to control contaminants in stormwater such as oil and grease traps will be employed to mitigate water quality concerns.

5.3.3 Special Status Species

A review of habitat requirements of sensitive animal species documented by the CNDDB as occurring in the project vicinity, and sensitive animal species known to occur in the general vicinity, was conducted by HBG. Animal species of special concern are present or possible as described below.

Special Status Plants

Habitat conditions at the project site are potentially suitable to support several species of special status plant. If present, development of the site as proposed could result in impacts to special status botanical species. The only way to ensure that populations of special status plants are not present in development sites would be to conduct a systematic protocol survey during the flowering period of the species.

Impact 6: If special status plant species are present at the site, project development could result in the elimination of populations of these species.

Mitigation 6: Systematic protocol rare plant surveys should be conducted during the flowering period of target species to definitively determine their presence or absence at the site. These plants, along with their flowering periods include, but are not necessarily limited to: big-scale balsamroot (March to June), Brandegee's clarkia (May to July), and stinkbells (March to June).

Special Status Animals

Vernal Pool Crustaceans -The seasonal wetland swales within the several drainages on the property do not provide suitable habitat for listed species of vernal pool crustaceans. The swales are flowing systems and not seasonal inundated depressions with more than two inches of ponding for at least two weeks (for VPFS) or four weeks (for VPTS). The drainages are also not suitable habitat for the California linderiella. No impacts to vernal pool fairy shrimp, vernal pool tadpole shrimp, or California linderiella would result from project development.

Steelhead Central Valley DPS- In the project area, Central Valley steelhead are found in Dry Creek and its tributaries in Secret Ravine and Miners Ravine, located as close as about 4 miles from the Project Site. No direct impacts would occur to steelhead habitat as no spawning or rearing habitat or occupied tributary streams are found on the Project Site. However, uncontrolled erosion from the developed site could result in consequent downstream sedimentation that could adversely affect spawning areas in Secret Ravine or Miners Ravine, and untreated stormwater runoff from onsite impervious surfaces could introduce contaminants that could adversely affect water quality that currently supports the life cycle of steelhead in these tributaries. Implementation of Mitigation Measure 5, with requirements to implement Best Management Practices as part of a Stormwater Pollution Prevention Plan to control erosion and migration of sediments off-site and other water quality control practices, will ensure that impacts to local steelhead populations do not occur.

Western Spadefoot Toad- A review of habitat conditions found on the site revealed that the seasonal swales at the site are flowing water systems that do not pond water for sufficient depth and duration to support the western spadefoot toad. No impacts to western spadefoot toad would result from project development.

Swainson's Hawk- Swainson's hawk is much more likely to nest in trees near riparian habitats or agricultural fields on the Valley floor rather than in oak woodland in the foothills, such as found at the Project Site. Nesting by Swainson's hawk at the Project Site is unlikely. Use of the Project Site by this species is probably limited to occasional visits while foraging. No impacts to Swainson's hawk breeding or foraging habitat is anticipated due to project development. Mitigation measures for preconstruction surveys of nesting birds include inclusion of this species in the surveys.

Burrowing Owl- No burrowing owls, California ground squirrel colonies or California ground squirrels were observed during field reviews. In addition, heights of grasses within the onsite grassland are too tall to provide habitat for burrowing owl, which prefers grasslands with low

profile vegetation. No impacts to burrowing owl breeding or wintering habitat is anticipated due to project development. Nevertheless, spring surveys of the site planned by an HBG wildlife biologist between late April and May of 2017 will include searches for this species, and mitigation measures for preconstruction surveys of nesting birds include inclusion of this species in the surveys.

Tricolored Blackbird- Vegetation within the onsite wetland swales is not of a type that would be preferred to support a nesting colony of tricolored blackbird. No impacts to tricolored blackbird would result from project development. Nevertheless, spring surveys of the site planned by an HBG wildlife biologist between late-April and May of 2017 will include searches for this species, and mitigation measures for preconstruction surveys of nesting birds include inclusion of this species in the surveys.

Special Status Raptor Species- Six raptor species designated with special status by the State of California have a potential to nest at the site. These species include burrowing owl (State Species of Special Concern and Federal Bird Species of Conservation Concern), Northern harrier (State Species of Special Concern and Federal Bird Species of Conservation Concern), white-tailed kite (California Fully Protected), Cooper's hawk (California Watch List Species), Sharp-shinned hawk (California Watch List Species) and Swainson's hawk (state-listed threatened). Preconstruction surveys for tree-nesting special status raptor species (e.g., white-tailed kite, Cooper's hawk, sharp-shinned hawk, Swainson's hawk) will be necessary if tree removal occurs during the February 1 to August 31 nesting season. Preconstruction surveys for ground-nesting special status raptor species (Northern harrier and burrowing owl) would be necessary prior to any ground disturbance in grasslands.

Impact 7: Construction during the nesting season could impact any of six raptor species designated with special status by the State of California: burrowing owl, Northern harrier, white-tailed kite, Cooper's hawk, sharp-shinned hawk, and Swainson's hawk.

> **Mitigation Measure 7:** Preconstruction surveys conducted for nesting birds pursuant to the MBTA should include specific preconstruction surveys for special status species of raptors. Preconstruction surveys for special status tree-nesting raptor species (white-tailed kite, Cooper's hawk, sharp-shinned hawk, Swainson's hawk) will be necessary if tree removal occurs during the February 1 to August 31 nesting season. A preconstruction survey for ground-nesting special status raptor species (Northern harrier and burrowing owl) should be conducted to ensure impacts to ground-nesting species do not occur. Preconstruction surveys should be conducted within 15 days of initiation of construction activity. If an active raptor nest is identified, appropriate mitigation measures shall be developed and implemented in consultation with CDFW. Mitigation would include development of a construction plan that establishes buffer zones around active nests during construction activity and/or until young have fledged.

6.0 AGENCY PERMIT REQUIREMENTS

Any potential impacts to jurisdictional wetlands or waters of the U.S. at the site will require authorization from the Army Corps of Engineers pursuant to Section 404 of the Clean Water Act. NWP 39 authorizes "discharges of dredged or fill material into non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters, for the construction or expansion of residential, commercial, and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures" provided the activities meet the following criteria:

- The discharge does not cause the loss of greater than 0.5-acre of non-tidal waters of the U.S.;
- The discharge does not cause the loss of greater than 300 linear feet of a stream bed (unless the criterion is waived by the District Engineer);
- The discharge is part of a single and complete project;
- The permittee avoids and minimizes discharges into waters of the U.S. to the maximum extent practicable;
- The discharge does not cause more than minimal degradation of water quality or more than minimal changes to stream flow characteristics; and
- The permittee establishes and maintains vegetated buffers next to open water to the maximum extent practicable.

As the 0.15 acres of seasonal wetlands are scattered throughout the site and avoidance of these wetlands would be problematic with any layout of land uses, a permit from the Corps is a certainty for development at this site. Wetland impacts would not exceed the 0.5-acre limit of Nationwide Permit 39; therefore, the Corps would determine that the proposed project would qualify for a Nationwide Permit 39 and an Individual Permit would not be required. A wetland mitigation plan describing procedures to mitigate impacts to jurisdictional areas would need to be developed as part of the Corps permit process. The applicant would need to demonstrate that wetlands have been avoided to the extent possible and provide documentation of how the project has been minimized to reduce onsite impacts.

The requirement for a Clean Water Act Section 404 Nationwide permit means that any development project at this site will also require Section 401 water quality certification from the Central Valley Regional Water Quality Control Board (RWQCB) for the Corps permit to be valid. Prior to issuance of the water quality certification, RWQCB will require the applicant to demonstrate that requirements of the County of Placer pursuant to the California Environmental Quality Act (CEQA) have been satisfied. Mitigation of wetlands will be required to obtain Corps and RWQCB approval. It does not appear as though A Section 7 consultation with USFWS or NOAA Fisheries/NMFS would be warranted as neither federally-listed species nor their habitats would not be adversely affected by project development. An Essential Fish Habitat evaluation conducted in conjunction with NMFS is also not likely warranted.

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ATTACHMENT 1

Figures

Figure 1. Project Location
Figure 2. U.S.G.S Map of the Project Site
Figure 3. Aerial Photo of the Project Site
Figure 4. Costco Wholesale Project Conceptual Plan
Figure 5. Soil Map of the Project Area
Figure 6. Watershed Map of the Project Area
Figure 7. Map of Vegetation Communities at the Project Site
Figure 8. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction
Figure 9. Impacts to Vegetation Communities Occurring on the Project Site
Figure 10. Impacts to Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction

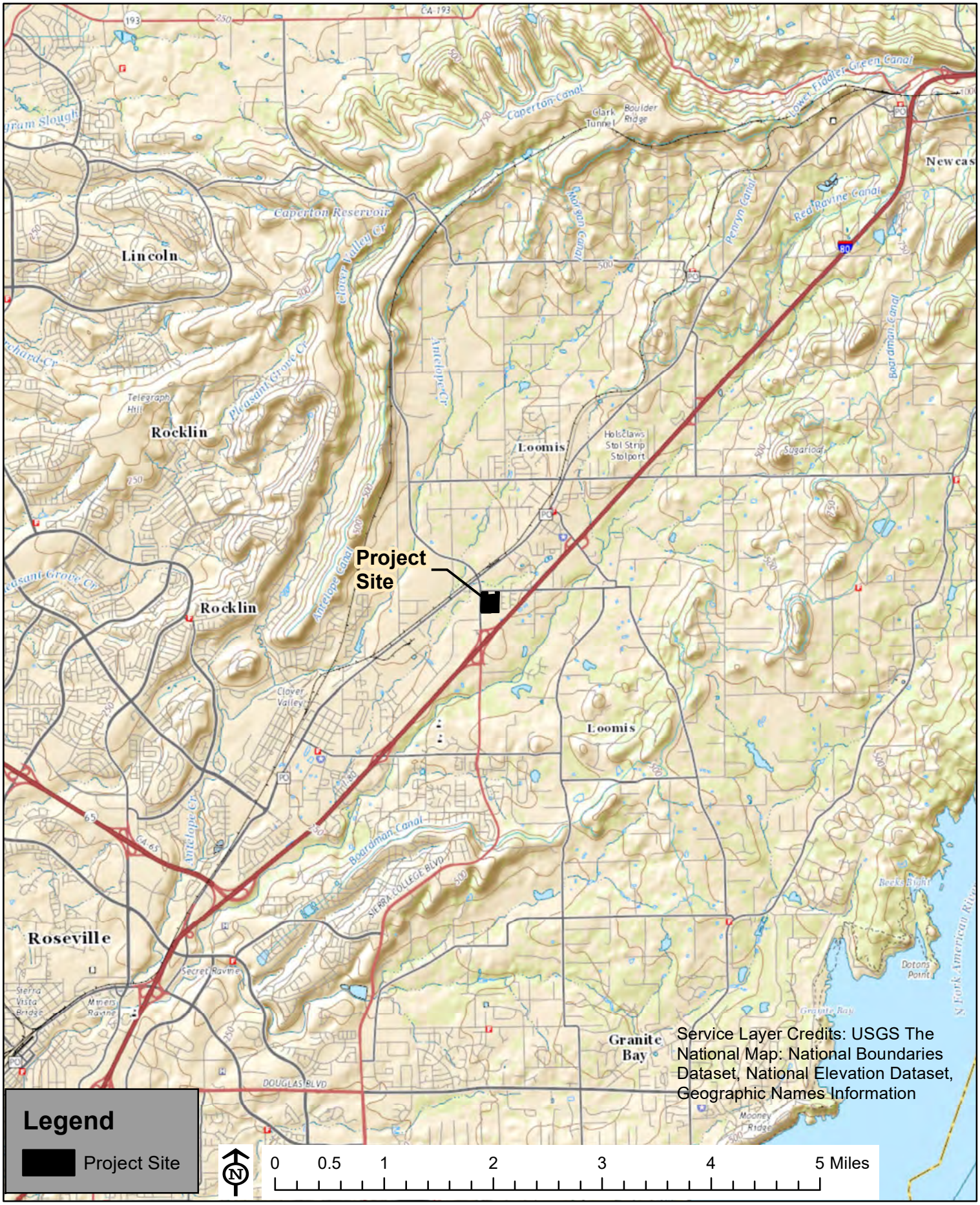

Figure 1. Project Location

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

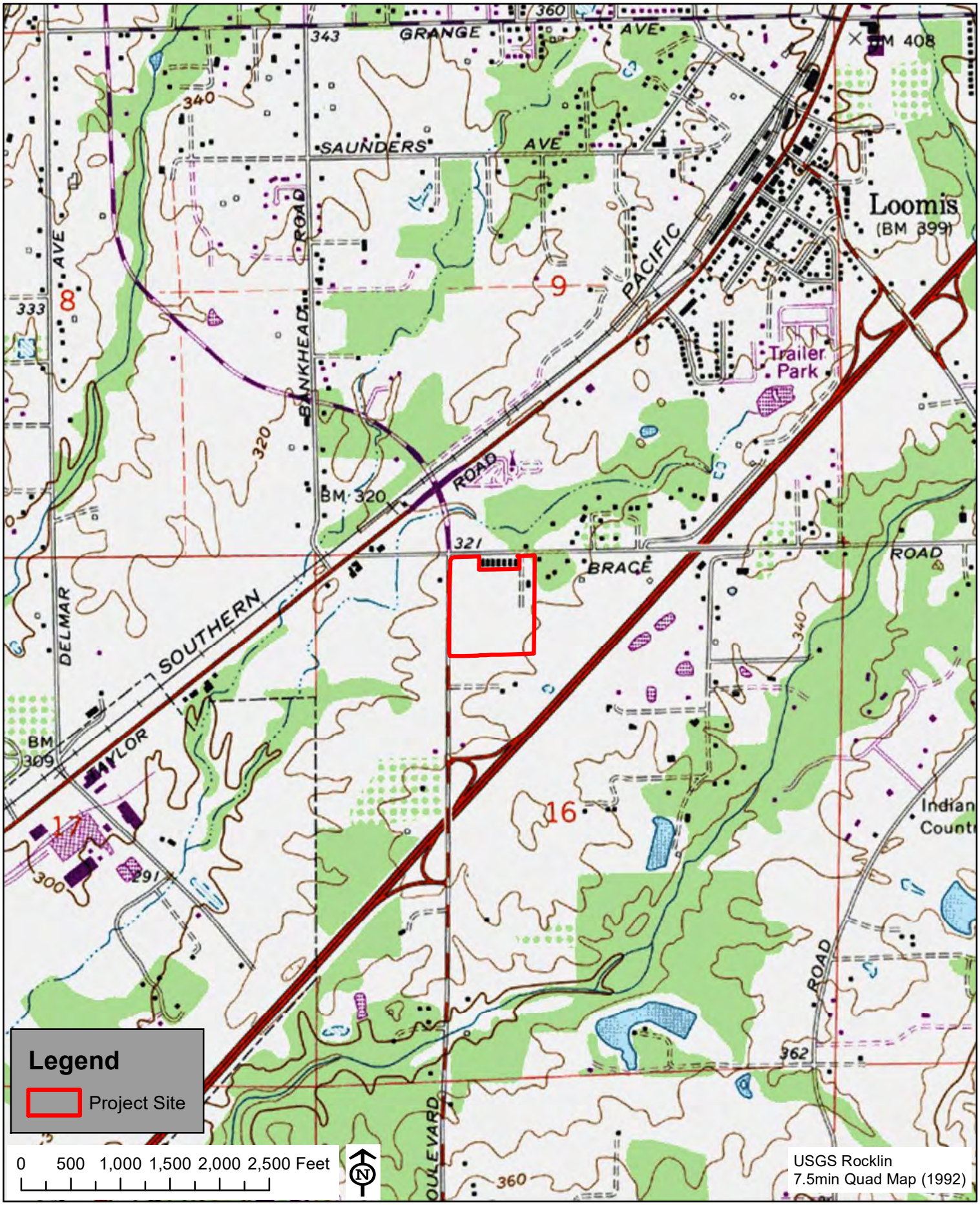

Figure 2. U.S.G.S Map of the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Figure 3. Aerial Photo of the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

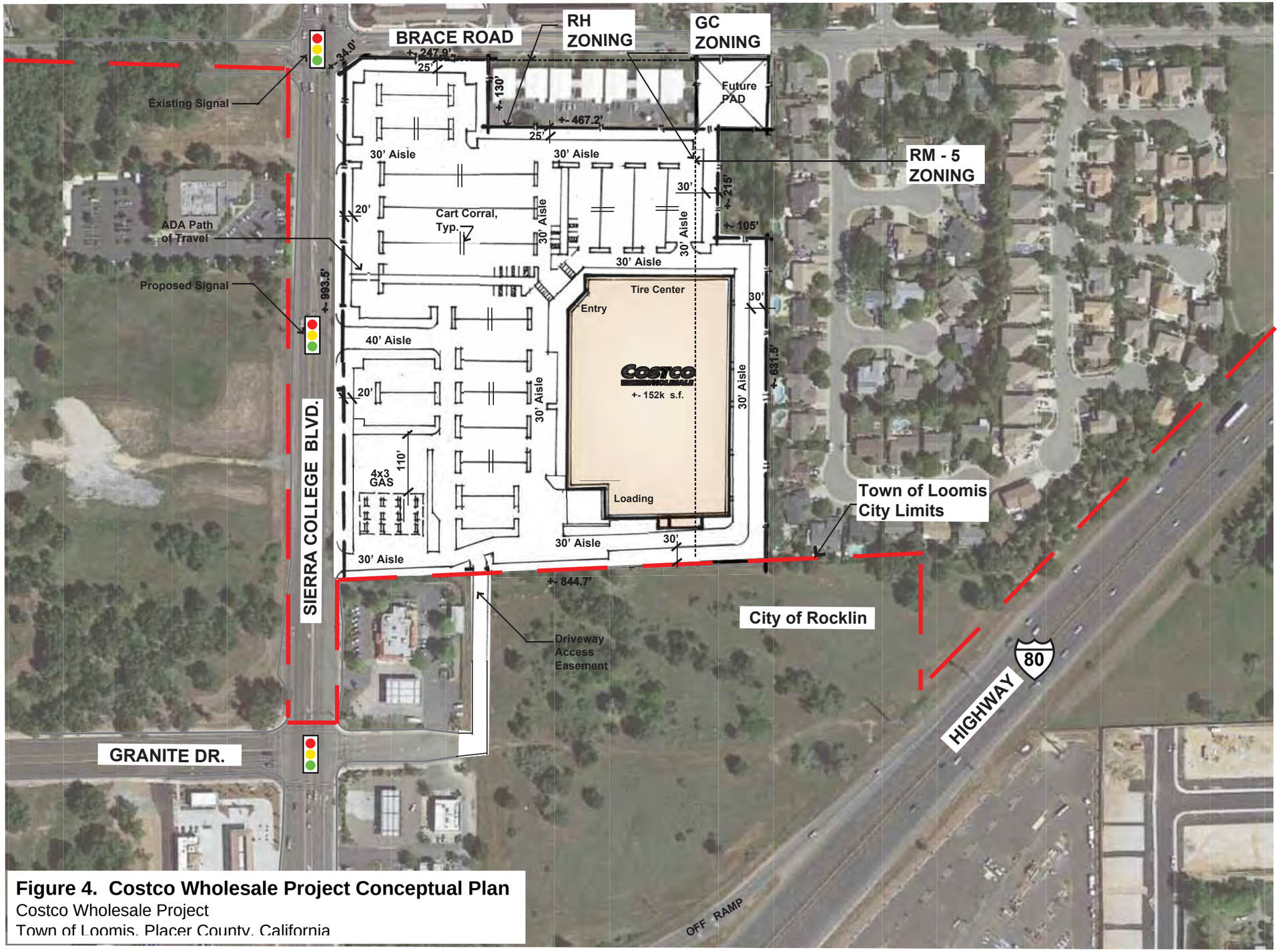

Figure 4. Costco Wholesale Project Conceptual Plan
Costco Wholesale Project
Town of Loomis, Placer County, California

Project Data

Client:	Costco Wholesale 999 Lake Drive Issaquah, WA 98027
Project Address:	Sierra College Blvd., Loomis, CA Town of Loomis

Site Data

Costco Site Area: Total:	±17.2 AC (±750,120 s.f.)
Jurisdiction:	Town of Loomis , CA
Zoning:	GC - General Commercial RM - 5 Medium Density Residential
Boundary Information:	This plan has been prepared using record information from Assessor's Parcel Maps and is for Preliminary use only. All dimensions and acreages are approximate only.

Building Data

Total:	+- 152, 101 s.f.
No Gas Expansion	

Parking Data

10' wide stalls:	774 stalls
Accessible stalls:	16 stalls
Total Parking:	790 Stalls (5.2/ 1,000)
Required Parking	760 (5.0 / 1,000)

DBA# P.256

DB+A

DAVID BABCOCK + ASSOCIATES
ARCHITECTURE LANDSCAPE PLANNING
3581 MT. DIABLO BLVD., SUITE 235
LAFAYETTE, CALIFORNIA 94549
T: 925.283.5070

COSTCO LOOMIS

PRELIMINARY CONCEPT SITE PLAN 1.2

0 75' 100' 200'
SCALE 1"= 200'
MAY 3, 2016
NORTH

SHEET 1 of 1

Figure 5. Soil Map of the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

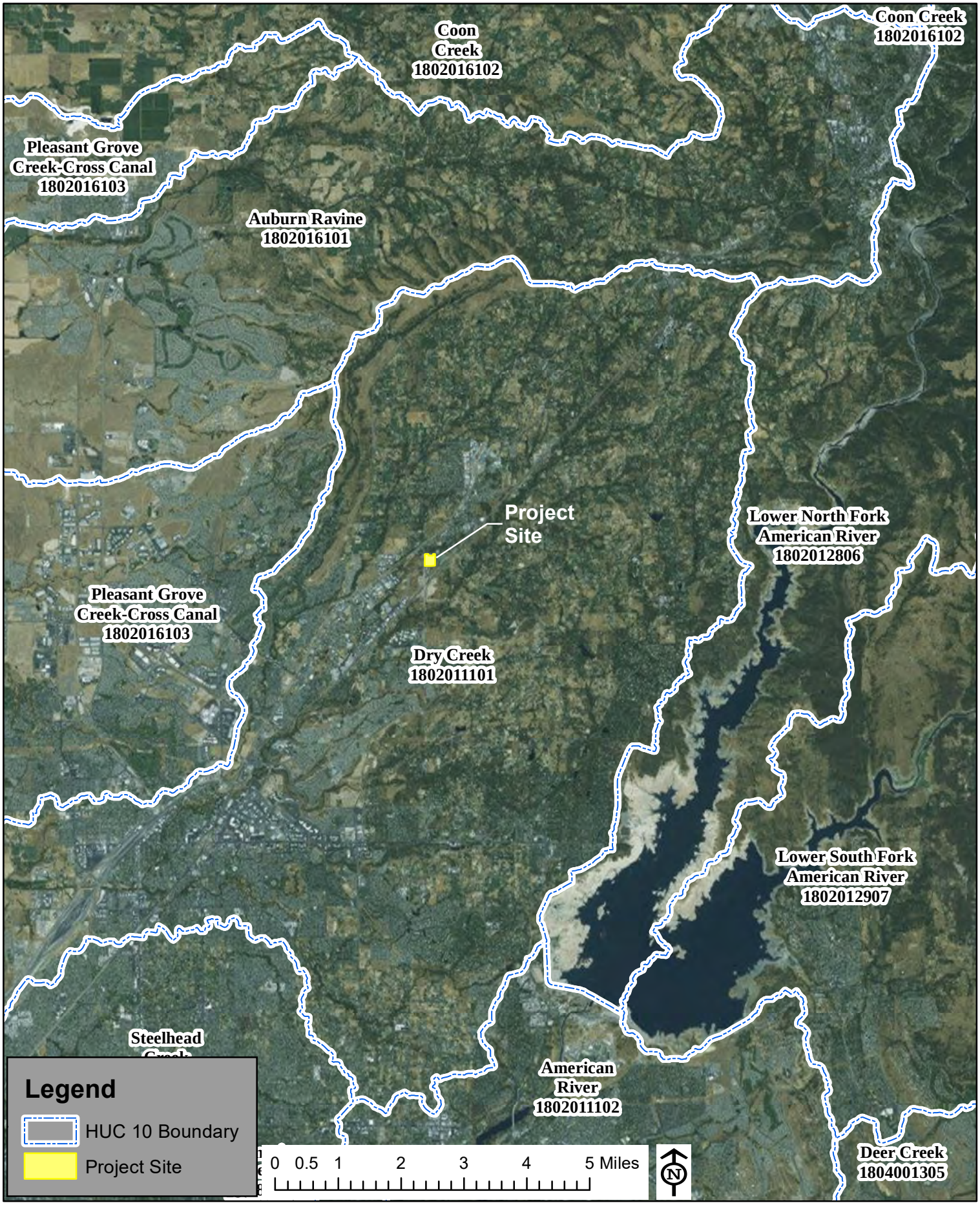

Figure 6. Watershed Map of the Project Area

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

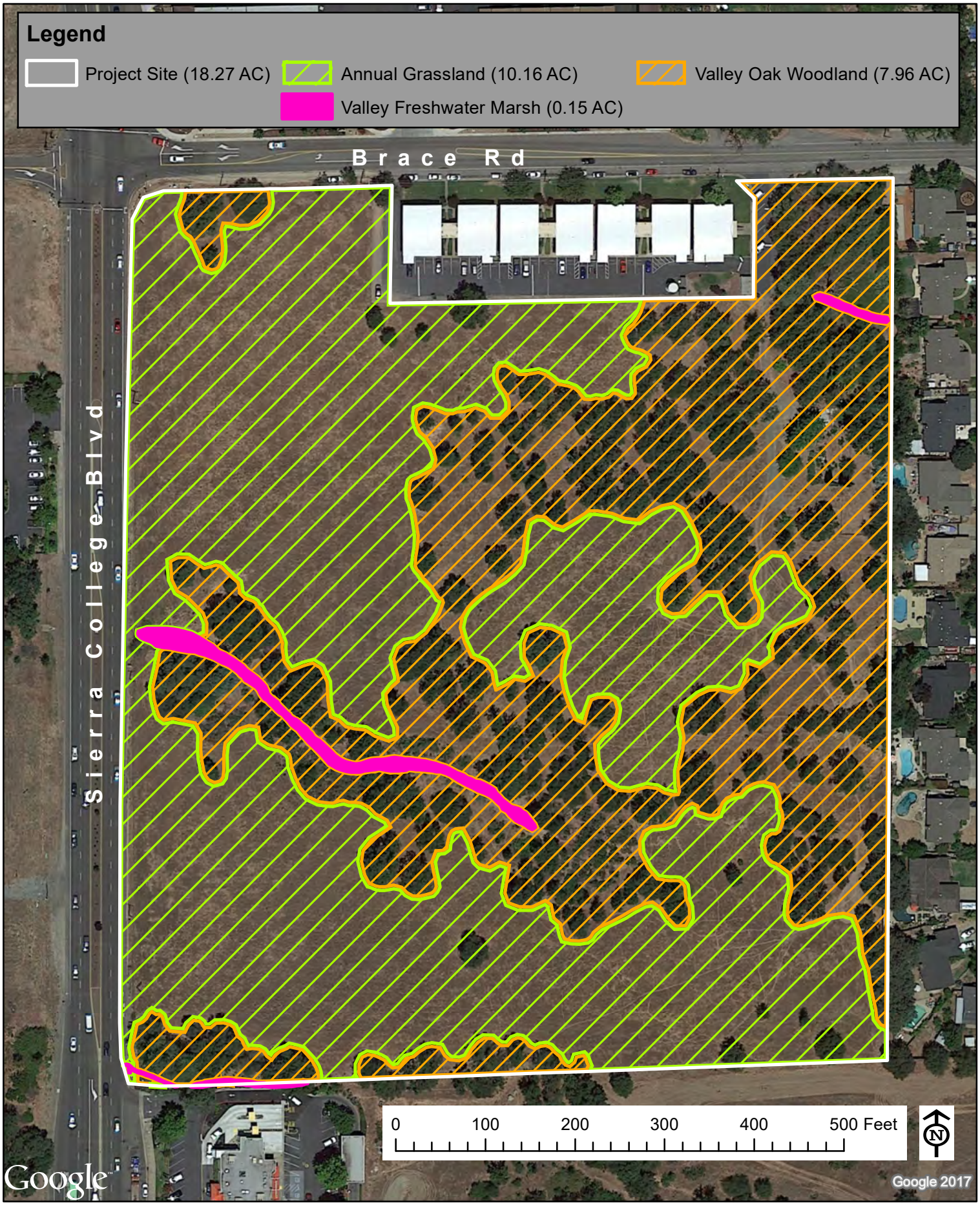

Figure 7. Map of Vegetation Communities at the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
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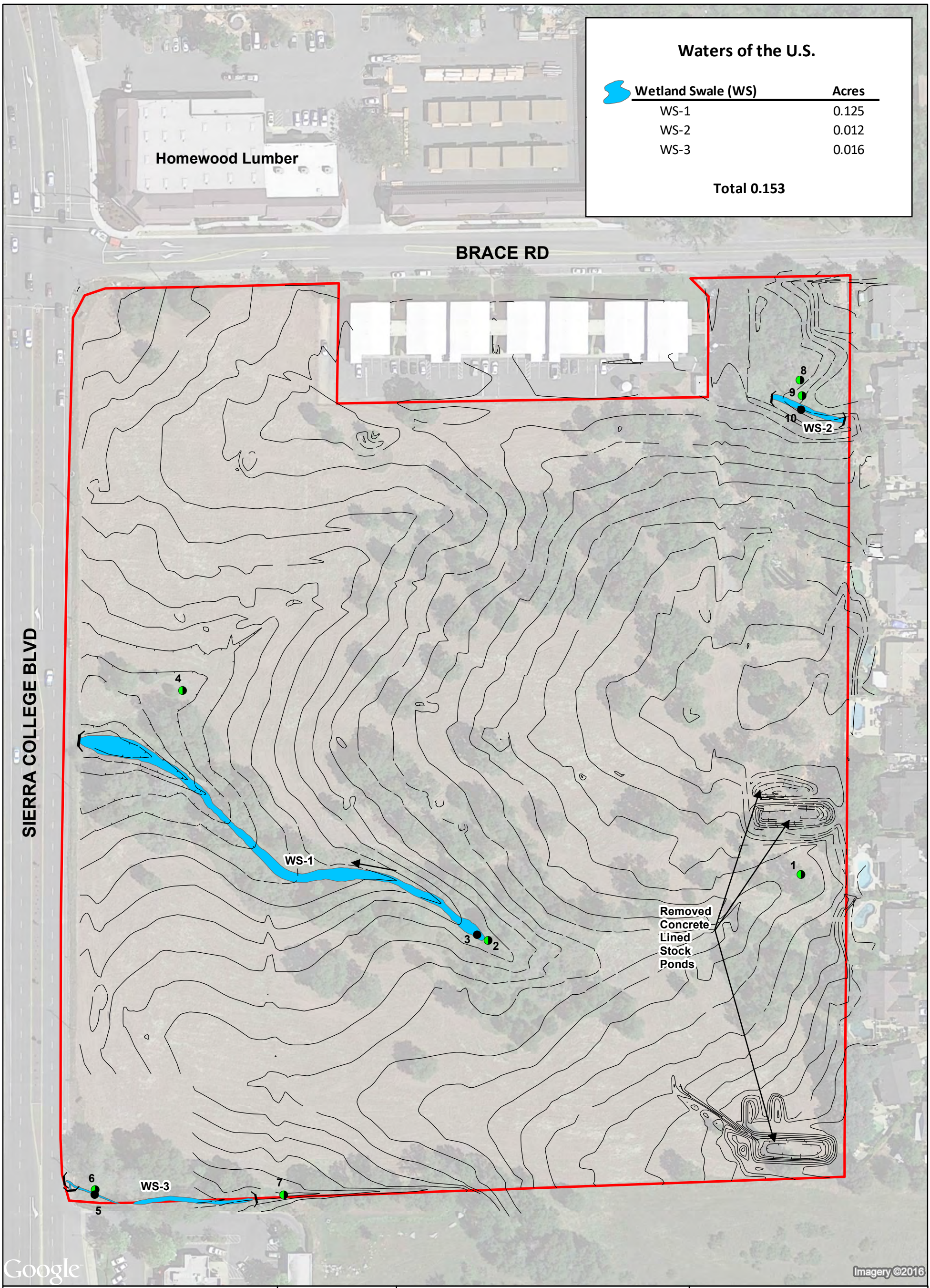

Prepared By:

Salix consulting, inc.

Prepared For:
Manikas Properties
1817 Maryal Drive, Suite 100
Sacramento, CA 95864

N

0 50 100
Feet

Legend

- Study Area (±18.20 acres)
- Culvert
- Wetland Data Point
- Upland Data Point

Figure 5

WETLAND DELINEATION

Sierra-Brace

Town of Loomis, Placer County, CA

April 18, 2016

Figure 8. Wetlands and Waters of the U.S. Subject to Corps Jurisdiction
Costco Wholesale Project
Town of Loomis, Placer County, California

NOTES: Revised wetland delineation conducted March 2016. Original delineation conducted by Pat Britton and Barry Anderson of North Fork Associates in 2007.

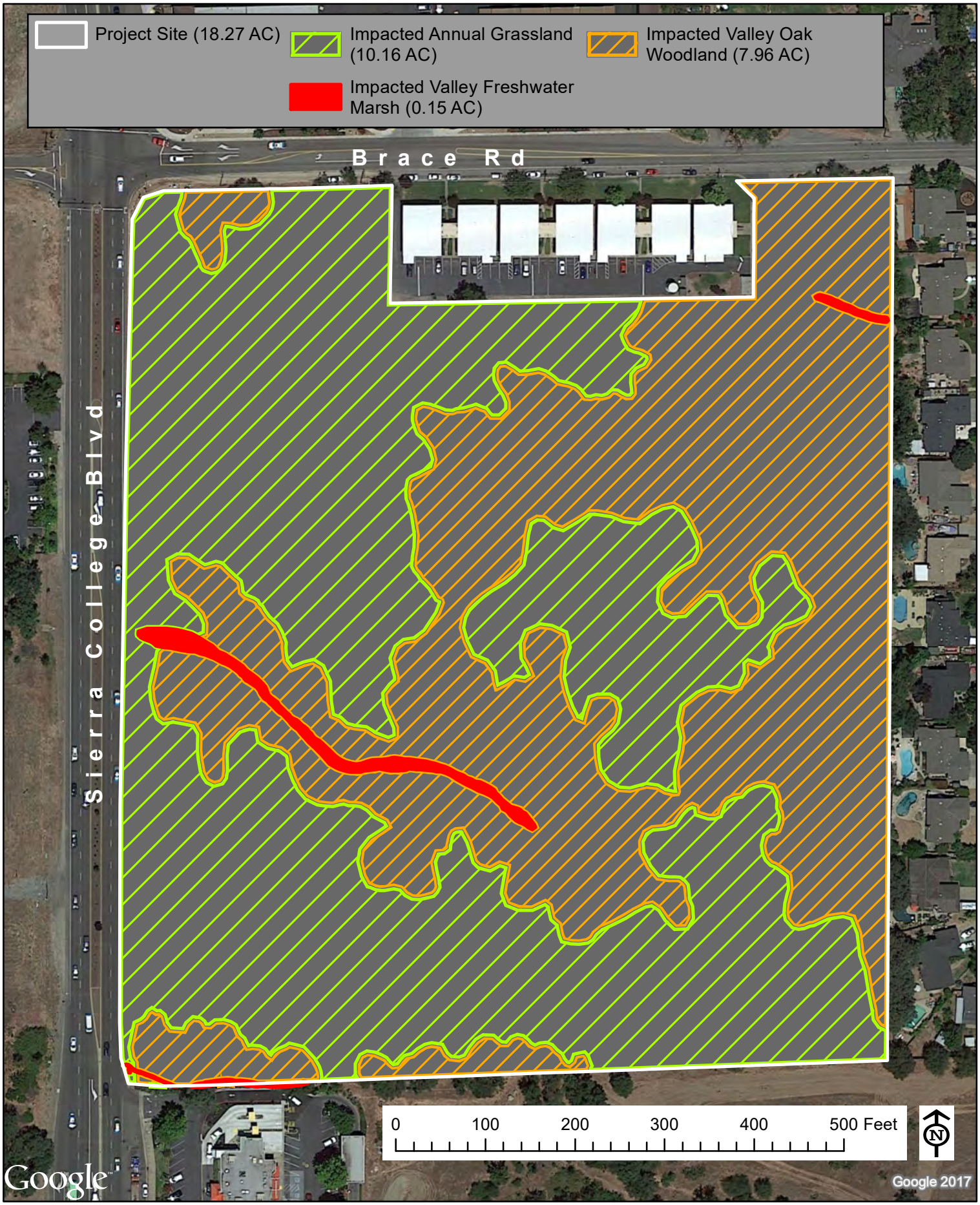

Figure 9. Impacts to Vegetation Communities Occurring on the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Figure 10. Impacts to Wetlands and Waters of the U.S. Subject to Corps Jurisdiction

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
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ATTACHMENT 2

SUPPLEMENTAL BIOLOGICAL INFORMATION

Table 1. Plant List for Property

Table 2. Animal Species Observed on the Project Site or Expected to Utilize the Project Site

Table 3. Special Status Plants Known to Occur in the Vicinity of the Project Area, Placer County, California

Table 4. Special Status Animal Species that have been Reported in the Vicinity of the Project Area, Placer County, California

TABLE 1. PLANT LIST FOR THE PROPERTY

Scientific Name	Common Name	Wetland Status
Acacia baileyana	Cootamundra wattle	UPL
Acmispon americanus var. americanus	Spanish-clover	UPL
Alisma triviale	California water plantain	OBL
Amsinckia menziesii	common fiddleneck	UPL
Artemisia douglasiana	California mugwort	FAC
Arundo donax	Giant reed	FACW
Avena fatua	Wild oat	UPL
Baccharis pilularis	Coyote brush	UPL
Briza minor	Small quaking grass	FAC
Bromus diandrus	Ripgut grass	UPL
Bromus hordeaceus	Soft chess	FACU
Carduus pycnocephalus	Italian thistle	UPL
Centaurea solstitialis	Yellow starthistle	UPL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canada thistle	FACU
Clarkia sp.	Clarkia	UPL
Claytonia perfoliata	Common miner's lettuce	FAC
Convolvulus arvensis	Bindweed	UPL
Cynodon dactylon	Bermudagrass	FACU
Cynosurus echinatus	Hedgehog dogtail	UPL
Cyperus eragrostis	Tall flatsedge	FACW
Cytisus scoparius	Scotch broom	UPL
Elymus caput-medusae	Medusahead	UPL
Epilobium brachycarpum	Summer cottonweed	UPL
Erigeron canadensis	Canadian horseweed	FACU
Erodium botrys	Broad-leaf filaree	FACU
Erodium cicutarium	Red-stem filaree	UPL
Eschscholzia californica	California poppy	UPL
Festuca perennis	Italian ryegrass	FAC
Galium aparine	Goose grass	FACU
Geranium dissectum	Cut-leaf geranium	UPL
Geranium molle	Dove's-foot geranium	UPL
Hirschfeldia incana	Short-podded mustard	UPL
Hordeum jubatum	Foxtail barley	UPL
Hordeum marinum subsp. gussoneanum	Mediterranean barley	FAC
Hordeum murinum	Wall barley	FACU
Hypericum perforatum subsp. perforatum	Klamathweed	FACU
Hypochaeris glabra	Smooth cat's-ear	UPL
Juncus mexicanus	Mexican rush	FACW
Juncus xiphioides	Iris-leaved rush	OBL
Lactuca serriola	Prickly lettuce	FACU

Lamium amplexicaule	Deadnettle	UPL
Lupinus bicolor	Miniature lupine	UPL
Lythrum hyssopifolia	Hyssop loosestrife	OBL
Melilotus sp.	Melilotus	UPL
Nasturtium officinale	Watercress	OBL
Olea europaea	Olive	UPL
Paspalum dilatatum	Dallis grass	FAC
Pinus sabiniana	Gray pine	UPL
Plantago lanceolata	English plantain	FAC
Polypogon monspeliensis	Annual beard grass	FACW
Populus fremontii subsp. fremontii	Fremont cottonwood	FAC
Prunus dulcis	Almond tree	UPL
Pyracantha sp.	Pyracantha	UPL
Pyrus sp.	Pear	UPL
Quercus douglasii	Blue oak	UPL
Quercus lobata	Valley oak	FACU
Quercus wislizeni	Interior live oak	UPL
Rubus armeniacus	Himalayan blackberry	FACU
Rumex crispus	Curly dock	FAC
Salix exigua var. exigua	Narrowleaf willow	FACW
Salix lasiolepis	Arroyo willow	FACW
Silybum marianum	Milk thistle	UPL
Sonchus asper subsp. asper	Prickly sow-thistle	FAC
Spartium junceum	Spanish broom	UPL
Torilis arvensis	Field hedgeparsley	UPL
Toxicodendron diversilobum	Western poison-oak	FACU
Trifolium hirtum	Rose clover	UPL
Verbascum blattaria	Moth mullein	UPL
Verbascum thapsus	Woolly mullein	FACU
Veronica sp.	Speedwell	VARIES
Vicia sativa	Common vetch	FACU
Vicia villosa	Winter vetch	UPL
Vinca major	Periwinkle	UPL

Source: Salix Consulting, Inc. 2016.

TABLE 2. ANIMAL SPECIES OBSERVED ON THE PROJECT SITE OR EXPECTED TO UTILIZE THE PROJECT SITE

MAMMALS

Virginia Opossum	*Didelphis virginiana*
Broad-footed Mole	*Scapanus latimanus*
California Myotis	*Myotis californicus*
Yuma Myotis	*Myotis yumanensis*
Western Pipistrelle	*Pipistrellus hesperus*
Big Brown Bat	*Eptesicus fuscus*
Hoary Bat	*Lasiurus cinereus*
Red Bat	*Lasiurus borealis*
Pallid Bat	*Antrozous pallidus*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Black-tailed Hare	*Lepus californicus*
Desert Cottontail	*Sylvilagus audubonii*
California Ground Squirrel	*Spermophilus beecheyi*
Botta's Pocket Gopher	*Thomomys bottae*
Western Harvest Mouse	*Reithrodontomys megalotis*
Deer Mouse	*Peromyscus maniculatus*
Dusky-footed Woodrat	*Neotoma fuscipes*
California Vole	*Microtus californicus*
Black Rat	*Rattus rattus*
Norway Rat	*Rattus norvegicus*
House Mouse	*Mus musculus*
Coyote	*Canis latrans*
Gray Fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Long-tailed Weasel	*Mustela frenata*
Striped Skunk	*Mephitis mephitis*
Mule Deer	*Odocoileus hemionus*

REPTILES AND AMPHIBIANS

Pacific Treefrog	*Pseudacris regilla*
Western Toad	*Bufo boreas*
Western Fence Lizard	*Sceloporus occidentalis*
Coast Horned Lizard	*Phrynosoma coronatum*
Western Skink	*Eumeces skiltonianus*
Gilbert’s Skink	*Eumeces gilberti*
Western Whiptail	*Cnemidophorus tigris*
Southern Alligator Lizard	*Gerrhonotus multicarinatus*

Ringneck Snake	*Diadophis punctatus*
Sharp-tailed Snake	*Contia tenuis*
Racer	*Coluber constrictor*
California Whipsnake	*Masticophis lateralis*
Coachwhip	*Masticophis flagellum*
Gopher Snake	*Pituophis melanoleucus*
Common Kingsnake	*Lampropeltis getulus*
Common Garter Snake	*Thamnophis sirtalis*
Western Terrestrial Garter Snake	*Thamnophis elegans*
Night Snake	*Hupsiglena torquata*
Western Rattlesnake	*Crotalis viridis*

BIRDS

Turkey Vulture	*Cathartes aura*
White-tailed Kite	*Elanus caeruleus*
Northern Harrier	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperi*
Red-tailed Hawk	*Buteo jamaicensis*
Red-shouldered Hawk	*Buteo lineatus*
Golden Eagle	*Aquila chrysaetos*
Bald Eagle	*Haliaeetus leucocephalus*
American Kestrel	*Falco sparverius*
Prairie Falcon	*Falco mexicanus*
Peregrine Falcon	*Falco peregrinus*
Merlin	*Falco columbarius*
California Quail	*Callipepla californica*
Killdeer	*Charadrius vociferous*
Wilson’s Snipe	*Gallinago delicata*
Ring-billed Gull	*Larus delawarensis*
California Gull	*Larus californicus*
Herring Gull	*Larus argentatus*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Barn Owl	*Tyto alba*
Great Horned Owl	*Bubo virginianus*
Western Screech-Owl	*Otus kennicottii*
Vaux’s Swift	*Chaetura vauxi*
Anna's Hummingbird	*Calypte annas*
Northern Flicker	*Colaptes auratus*
Acorn Woodpecker	*Melanerpes formicivorus*
Lewis’s Woodpecker	*Melanerpes lewis*
Red-breasted Sapsucker	*Sphyrapicus ruber*

Nuttall’s Woodpecker	*Picoides nuttallii*
Downy Woodpecker	*Dendrocopos pubescens*
Black Phoebe	*Sayornis nigricans*
Say's Phoebe	*Sayornis saya*
Pacific-slope Flycatcher	*Empidonax difficilus*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Western Kingbird	*Tyrannus verticalis*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	*Petrochelidon pyrrhonota*
Tree Swallow	*Tachicineta bicolor*
Violet-green swallow	*Tachycineta thalassina*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
California Scrub-jay	*Aphelocoma californica*
American Crow	*Corvus brachyrhynchos*
Common Bushtit	*Psaltriparus minimus*
Oak Titmouse	*Parus inornatus*
White-breasted Nuthatch	*Sitta carolinensis*
Bewick's Wren	*Thryomanes bewickii*
House Wren	*Troglodytes aedon*
American Robin	*Turdus migratorius*
Hermit Thrush	*Hylocichla guttata*
Western Bluebird	*Sialia mexicana*
Ruby-crowned Kinglet	*Regulus calendula*
Northern Mockingbird	*Mimus polyglottos*
Cedar Waxwing	*Bombycilla cedrorum*
Loggerhead Shrike	*Lanius ludovicianus*
Hutton’s Vireo	*Vireo huttonni*
Orange-crowned Warbler	*Orethlypis celata*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaha coronata*
Townsend's Warbler	*Setophaga townsendi*
Common Yellowthroat	*Geothlypis trichas*
Western Tanager	*Piranga ludoviciana*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Lazuli Bunting	*Passerina amoena*
Spotted Towhee	*Pipilo maculatus*
California Towhee	*Pipilo crissalis*
Savannah Sparrow	*Passerculus sandwichensis*
Lark Sparrow	*Chondestes grammacus*
White-crowned Sparrow	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia maxillaris*
Lincoln's Sparrow	*Melospiza lincolnii*

Dark-eyed Junco	*Junco hyemalis*
Western Meadowlark	*Sturnella neglecta*
Red-winged Blackbird	*Agelaius phoeniceus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown-headed Cowbird	*Molothrus ater*
Bullock's Oriole	*Icterus bullockii*
Purple Finch	*Haemorhous purpureus*
House Finch	*Carpodacus mexicanus*
Pine Siskin	*Spinus pinus*
American Goldfinch	*Spinus tristis*
Lesser Goldfinch	*Spinus psaltria*
House Sparrow	*Passer domesticus*

Mayer and Laudenslayer (1988)
National Geographic Society (2011)
Reid (2006)
Sibley (2014)
Stebbins (2003)
Zeiner et al. (1990a, 1990b, 1990c)

TABLE 3. SPECIAL STATUS PLANTS KNOWN TO OCCUR IN THE VICINITY OF THE PROJECT AREA, PLACER COUNTY, CALIFORNIA [1]

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Big-scale (California) balsamroot (*Balsamorhiza macrolepis var. macrolepis*)	--/--/1B.2	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite; 90-1400m.	Possible. Suitable habitat may be present on the site. Surveys to be conducted spring/summer 2017.
Stebbins morning-glory *(Calystegia stebbinsii)*	FE/CE/1B1	Found in chaparral, cismontane woodland. Occurs on red clay soils of the pine-hill formation, on gabbro or serpentine. Prefers open areas. 300-725 M.	Not present. Suitable habitat not present at the site.
Pine Hill ceanothus (*Ceanothus roderickii*)	FE/Rare/1B.2	Found in chaparral and cismontane woodland. In gabbroic soils, often in disturbed area with other rare plants. 260-630 m.	Not present. Suitable habitat not present at the site.
Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*)	--/--/4.2	Found in chaparral, cismontane woodland, and lower montane coniferous forest. Often in roadcuts. 75-915 m.	Possible. Suitable habitat may be present on the site. Surveys to be conducted spring/summer 2017.
Red Hill soaproot (*Chlorogalum grandiflorum*)	--/--/1B.2	Found in cismontane woodland, chaparral, and lower montane coniferous forest. Occurs frequently on serpentine or gabbro, but also on non-ultramafic substrates and often on disturbed sites. 240-760 m.	Not present. Suitable habitat not present at the site.
Hispid salty bird's beak *(Chloropyron molle ssp. hispidum)*	--/--1B/1	Found in damp alkaline soils in meadows, seeps, playas, valley and foothill grassland. Especially in alkaline meadows and alkali sins with *Distichlis*. 1-155 M.	Not present. Suitable habitat not present at the site.
Dwarf downingia (*Downingia pusilla*)	--/--/2B.2	Found vernal pools and mesic sites within valley and foothill grassland. Found along margins of several types of vernal pools. 1-445 m.	Not present. Suitable habitat not present at the site.

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Stinkbells (*Fritillaria agrestis*)	--/--/4.2	Found in cismontane woodland, chaparral, and valley and foothill grassland. Sometimes found on serpentine, mostly found in non-native grassland or in grassy openings in clay soil. 10-1555 m.	Possible. Suitable habitat may be present on the site. Surveys to be conducted spring/summer 2017.
El Dorado bedstraw (*Galium californicum ssp. sierra)*	FE/Rare/1B.2	Found in cismontane woodland, chaparral, and lower montane coniferous forest. Occurs in pine-oak woodland or chaparral. Restricted to gabbroic or serpentine soils. 130-585 M.	Not present. Suitable habitat not present at the site.
Bogg's Lake hedge hyssop (*Gratiola heterosepala*)	--/CE/1B.2	Inhabits vernal pools and freshwater swamps and marshes. In clay soils and usually in vernal pools, sometime on lake margins. 10-2375 m.	Not present. Suitable habitat not present at the site.
Bisbee Peak rush-rose (*Helianthemum suffrutescens*)	--/--/3.2	Found in openings in chaparral, often on serpentine, gabbroic, or Ione formation soils. 45-840 m.	Not present. Suitable habitat not present at the site.
Ahart's dwarf rush (Juncus leiospermus var. ahartii)	--/--/ 1B.2	Restricted to the edge of vernal pools. Vernal pools and grasslands. 30-229 m.	Not present. Suitable habitat not present at the site.
Red Bluff dwarf rush *(Juncus leiospermus var. leiospermus)*	--/--/1B.1	Found in vernally mesic sites, sometimes on edges of vernal pools within chaparral, valley and foothill grassland, cismontane woodland, vernal pools, meadows and seeps. 30-1025 M.	Not present. Suitable habitat not present at the site.
Legenere (*Legenere limosa*)	--/--/1B.1	Found in the beds of vernal pools. Many historical occurrences are extirpated. 1-880 m.	Not present. Suitable habitat not present at the site.
Pincushion navarretia (*Navarretia myersii* ssp. *myersii*)	--/--/1B.1	Found in vernal pools, in clay soils within non-native grassland. 20-330 m.	Not present. Suitable habitat not present at the site.
Sacramento Orcutt grass (*Orcuttia viscida*)	FE/CE/1B.1	Found in vernal pools. 30-100 m.	Not present. Suitable habitat not present at the site.

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Layne's ragwort (*Packera layneae*)	FT/Rare/1B.2	Found in ultramafic soil, occasionally along streams in chaparral and cismontane woodland. 200-1000 m.	Not present. Suitable habitat not present at the site.
Sanford's arrowhead (*Sagittaria sanfordii*)	--/--/1B.2	Found in marshes and swamps. In standing or slow-moving freshwater ponds, marshes and ditches. 0-650 m.	Not present. Suitable habitat not present at the site.
El Dorado County mule ears (*Wyethia reticulata*)	--/--/1B.2	Found in chaparral, cismontane woodland, and lower montane coniferous forest. Found in stony red clay and gabbroic soils, often in openings in gabbro chaparral. 185-630 m.	Not present. Suitable habitat not present at the site.

1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the Rocklin 7.5-Minute Quadrangle Map and surrounding areas, information dated February 2017.

2. Status Codes:

FE	Federal-listed Endangered
FT	Federal-listed Threatened
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
CE	California State-listed Endangered
CT	California State-listed Threatened
CR	California Rare
FP	California Fully Protected
CSC	California Species of Special Concern

California Rare Plant Rank 1A:	Plants presumed extirpated in California and either rare or extinct elsewhere.
California Rare Plant Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere.
California Rare Plant Rank 2A:	Plants presumed extirpated in California, but more common elsewhere.
California Rare Plant Rank 2B:	Plants rare, threatened, or endangered in California, but more numerous elsewhere.
California Rare Plant Rank 3:	Plants about which more information is needed – a review list.
California Rare Plant Rank 4:	Plants of limited distribution – a watch list.

CNPS Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

TABLE 4. SPECIAL STATUS ANIMAL SPECIES THAT HAVE BEEN REPORTED IN THE VICINITY OF THE PROJECT AREA, PLACER COUNTY, CALIFORNIA

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Invertebrates			
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	FT/--	Inhabits vernal pools; occurs throughout the Delta and Central Valley.	Not present. Suitable habitat is not present on site.
Vernal Pool Tadpole Shrimp (*Lepidurus packardi*)	FE/--	Inhabits vernal pools; known from scattered locations in the Delta and Central Valley.	Not present. Suitable habitat is not present on site.
California Linderiella (*Linderiella occidentalis*)	--/--	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	Not present. Suitable habitat is not present on site.
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	FT/--	Inhabits blue elderberry bushes (host plant); restricted to the Central Valley and adjacent foothills.	Not present. No elderberries were observed at the site during site surveys, therefor no potential habitat exists at the site for this species
Ricksecker's Water Scavenger Beetle (*Hydrochara ricksecker*i)	--/--	Aquatic beetle that lives in weedy shallow, open water associated freshwater seeps, springs, farm ponds, vernal pools (playa type pools) and slow-moving stream habitats.	Not present. Suitable habitat is not present on site.
Alabaster Cave harvestman *Banksula californica*	--/--	Known only from the type locality, Alabaster Cave in El Dorado County. The type locality has been partly destroyed by mining and the species may be extinct.	Not present. Suitable habitat is not present on site.

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Fish			
Conumnes stripetail *(Cosumnoperla hypocrena)*	--/--	Found in intermittent streams on the western slope of the Central Sierra Foothill in the American and Cosumnes River Basins.	Not present. Suitable habitat is not present on site.
Steelhead- Central Valley DPS *(Oncorhynchus mykiss irideus)*	FT/--	Population occur in the Sacramento and San Joaquin Rivers and their tributaries. In the project area found in Dry Creek and its tributaries in Secret Ravine and Miners Ravine.	Not present. Suitable habitat is not present onsite; no large river systems or suitable spawning streams. Suitable spawning habitat located about 4 miles southwest of the site in Secret Ravine and Miners Ravine. Best Management Practices are necessary to control contaminants in stormwater runoff.
Amphibians			
Western Spadefoot Toad (*Spea hammondii*)	--/CSC	Breeds in vernal pools/seasonal stock ponds in the Central Valley and southern coast.	Not present. Although there are records in the CNDDB in vicinity of the property, onsite wetlands do not have characteristics sufficient to support this species.
California Red-legged Frog *(Rana draytonii)*	FT/CSC	Inhabits freshwater creeks and ponds in the scattered areas along the Coast Rangers from northern California down to northern Baja.	Not present. No CNDDB records in immediate vicinity of the property. The study site is considered to be outside of the current range of this species. Additionally, non-tidal wetlands onsite are seasonal and do not provide the perennial waters typically required for California Red-legged Frog.

Reptiles			
Western Pond Turtle *(Emys marmorata)*	--/CSC	Inhabits freshwater ponds and sluggish streams; occurs from WA to Baja, mostly west of the Sierra crest.	Not present. Suitable habitat is not present on site.
Birds			
Great Blue Heron (rookery site) *(Ardea herodias)*	--/--	Forms rookeries in large tree stands; occurs throughout California and elsewhere.	Rookery not present. Rookeries unlikely on the study site due to a lack of suitable trees.
Prairie Falcon *(Falco mexicanus)(*Nesting)	BCC/WL	Associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields and desert scrub. Permanent resident and migrant along inner coast and ranges.	Nesting unlikely. Appropriate nest sites not present. This species may forage on the site in winter, though none were observed in February 2017.
Peregrine Falcon *(Falco peregrinus anatum)(*Nesting)	Delisted,BCC /Delisted,FP	Inhabits open wetlands near cliffs, also occurs in some cities where nests on buildings and bridges.	Nesting unlikely. Appropriate nest sites not present.
Merlin *(Falco columbarius)* [wintering]	-/WL	Breeds in Canada, winters in a variety of California habitats, including grasslands, savannahs, wetlands, etc.	Wintering possible. The species may sporadically utilize the site as a winter foraging habitat.

Sharp-shinned Hawk *(Accipiter striatus)* [nesting]	-/WL	Breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers, but not restricted to, riparian habitats. North facing slopes, with plucking perches are critical requirements. All habitats except alpine, open prairie, and bare desert used in winter.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter.
Cooper's Hawk *(Accipiter cooperii)* [nesting]	-/WL	Nests primarily in deciduous riparian forests; forages in open woodlands.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter.
Osprey (*Pandion haliaetus*) [Nesting]	--/WL	Breeds in northern California from the Cascade Ranges south to Lake Tahoe, and along the coast south to Marin County. Associated strictly with large, fish-bearing waters, primarily in Ponderosa pine through mixed conifer habitats.	Nesting unlikely. Suitable nesting habitat not present on site.
Ferruginous Hawk *(Buteo regalis)* (wintering)	BCC/CSC	Inhabits open country. Winters in small numbers along California coast and inland valleys.	Wintering possible. The site is considered suitable wintering foraging habitat, though none were observed in February 2017 field studies.
Swainson's Hawk (nesting) *(Buteo swainsoni)*	BCC/CT	Nests in trees and riparian stands; summer migrant to Central Valley. Suitable foraging areas include grasslands, pastures, alfalfa and other hay crops, and certain grain and row croplands.	Nesting unlikely. CNDDB records indicate this species nests within two miles of the site. Nests unlikely on the property. The site may provide marginally suitable foraging habitat for this species. To be included in preconstruction surveys.

Northern Harrier *(Circus cyaneus)* (nesting)	--/CSC	Forages and nests in grasslands, marshes, and agricultural fields; occurs throughout California, concentrated in the Central Valley and coastal valleys.	Nesting unlikely. Suitable nesting habitat not present on site.
White-tailed Kite *(Elanus leucurus)* (nesting)	--/FP	Nests in dense oaks, willows, other trees; occurs in the Central Valley and adjacent low foothills.	Nesting unlikely. No CNDDB nesting records in vicinity. Nests unlikely on the study site due to a lack of suitable trees.
Bald Eagle *(Haliaeetus leucocephalus)* (nesting and wintering)	Delisted,BCC /CE,FP	In winter, maybe be found throughout most of California at lakes, reservoirs, rivers and some rangelands and coastal wetlands. California's breeding habitats are mainly located in mountains and foothill forests near permanent water sources.	Nesting unlikely. Suitable nesting habitat not present on site.
Golden Eagle *(Aquila chrysaetos)* [nesting and wintering]	BCC/WL,FP	Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert.	Wintering possible. The site likely receives sporadic use by the species in winter.
California black rail *(Laterallus jamaicensis coturniculus)*	--/CT,FP	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt marsh with dense growths of pickleweed; also occurs in freshwater and brackish marshes.	Not present. Suitable habitat is not present at the site.
Short-eared Owl (nest site) *(Asio flammeus)*	--/CSC	Forages and nests in perennial marsh and grassland habitat; occurs in the Central Valley, coast, and east Sierra regions.	Nesting unlikely. Suitable nesting habitat not present on site.

Western Burrowing Owl *(Athene cunicularia hypugea)* (burrow sites)	BCC/CSC	Nests in mammal burrows, rock cavities in grassland and scrub; occurs throughout much of mid and lower California.	Not present. Although CNDDB documents nesting records in the project, suitable habitat is not present at the site due to tall heights of upland grasses and general lack of California ground squirrels and ground squirrel burrows. No individuals were observed during surveys in February 2017. To be included in preconstruction surveys.
Purple Martin *(Progne subis)*	--/CSC	Uses a variety of wooded, low-elevation habitats throughout California. Uses hardwood and hardwood-conifer habitats as well as riparian habitats. Now a rare and local breeder on the coast and in interior mountain ranges.	Nesting unlikely. Suitable nesting habitat not present on site.
Loggerhead Shrike *(Lanius ludovicianus)* (nesting)	BCC/CSC	Habitat includes open areas such as desert, grasslands, and savannah. Nests in thickly foliaged trees or tall shrubs. Forages in open habitat which contains trees, fence posts, utility poles and other perches.	Unlikely. Although not recorded for the project area in the CNDDB, trees and shrubs provide suitable nesting habitat. Not observed during surveys conducted in February 2017. To be included in preconstruction surveys.
Grasshopper Sparrow *(Ammodramus savannarum)*	--/CSC	Found in dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches.	Nesting unlikely. Suitable nesting habitat not present on site.
Yellow Warbler *(Setophaha petechia)* [nesting]	BCC/CSC	Breeds in deciduous riparian woodlands, widespread during fall migration.	Nesting not present. May occur on site during fall migration, but suitable nesting habitat is not present at the site.
Tricolored Blackbird *(Agelaius tricolor)* (nesting colony)	BCC/CE, CSC	Nests in cattails, riparian scrub, and other dense marsh vegetation; occurs in SF Bay, Delta, and Central Valley basin.	Nesting not present. Appropriate nest sites not present. To be included in preconstruction surveys.

Mammals			
Silver-haired bat *(Lasionycteris noctivagans)*	--/--	Coastal and montane forests. Feeds over streams, ponds and open bushy areas, roosts in hollow trees.	Not present. Suitable habitat is not present at the site.
Pallid bat *(Antrozous pallidus)*	-/CSC	Roosts primarily in oak woodland and ponderosa pine habitats; forages in open areas.	Not present. Suitable habitat is not present at the site.
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	--/CCT,CSC	Found in desert scrub and coniferous forests. Roost in caves or abandoned mines and occasionally are found to roost in buildings.	Not present. Suitable habitat is not present at the site.
American badger *(Taxidea taxus)*	-/CSC	Drier open stages of most shrub, forest, and herbaceous habitats; needs sufficient food, friable soils and open, uncultivated ground.	Not present. Suitable habitat is not present at the site.

1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the Rocklin 7.5-Minute Quadrangle Map and surrounding areas, information dated February 2017.

2. Status Codes:

FE Federal-listed Endangered
FT Federal-listed Threatened
FPE Federally Proposed Endangered
FPT Federally Proposed Threatened
BCC USFWS Bird Species of Conservation Concern

CE California State-listed Endangered
CT California State-listed Threatened
CR California Rare
FP California Fully Protected
CSC CDFW Species of Special Concern
WL CDFW Watch List Species

ATTACHMENT 3

Arborists Report for Costco Site, Loomis, CA,
Prepared by Mann Made Resources, December 9, 2016.

Mann Made Resources
Arborist Consulting and Tree Conservation Products

December 9, 2016

Mr. Steve Calcagno
Kier & Wright Civil Engineers & Surveyors
2850 Collier Canyon Road
Livermore, CA 94551

SUBJECT: ARBORISTS REPORT FOR COSTCO SITE, LOOMIS, CA

Dear Mr. Calcagno,

Thank you for the opportunity to provide Arborist Consulting Services. The trees on the subject property were inspected on Friday, Saturday, and Sunday, November 18, 19, and 20, and December 9, 2016, and this report provides the findings from the inspections.

Assignment and Background: You contacted my office on October 30th to request an arborist inspection of the trees located within the construction site in Loomis on Sierra College Boulevard and Brace Road for a proposed Costco. I provided a proposal, and you provided the site image to work from. The assignment was to list all Blue Oak trees 4 inches diameter and greater, and all Live Oak and Valley Oak trees 6 inches diameter and greater. You also asked for an estimate of the mitigation required for the removal of the trees on the property.

Observations: The site was inspected on Friday, Saturday, and Sunday, November 18, 19, and 20, with a re-visit on Friday, December 9, 2016 to capture 9 trees that were not completed during the previous site visits. The site is an open area surrounded by fencing, bordered by Sierra College Boulevard top the west, Brace Road to the north, and the Rocklin Border to the south. An apartment complex is adjacent to the property on Brace Road, and the entry gate to the property was behind the driveway into the apartment complex. There is a piece of excess property to the east of the apartment complex that was included in the survey. Twenty eight trees were found to be in the excess property.

Prior to beginning the survey, I reviewed the Loomis Tree Preservation Ordinance to assure the data collected meets their requirements. A Trimble Geo7X unit was used to capture the data and tree locations. A tree ID number was listed on the map image, and the tree tag number was listed for each tree, and the data spreadsheet lists both numbers for easier field identification. The Tree ID number is shown on the KMZ file except for the last 9 trees along Brace Road that were captured using Google Earth, and the Tree ID number and the tag number are the same for those trees.

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Each Oak tree was visited and measured. Undersized trees were not listed. Most of the trees had 1 or two previous tag numbers, and a new number was given to each tree for this inspection. Three trees were double numbered with 301, 302, and 303, before I caught that the same numbers were already used. The double number trees are differentiated by the Tree ID numbers. The tag I installed has the nail head tilted downward so the tag falls away from the tree. Tree tags are typically good for at least three years. After three years, tags may need to be replaced as the tree can grow over the tag which makes the tag number unable to be read. Each tree ID number is the number shown on the KMZ file aerial image.

The required data to be collected was:

i. Tree number
ii. Tree species/common name
iii. Diameter at 4.5' above grade, or the best measurement for diameter if 4.5 was not a good representation of the trunk diameter.
iv. Condition determined by combining vigor, structure, and ability to grow on the site, rated from Excellent, Good, Fair, Major Problems, Extreme Problems, or Dead. Condition ratings are used to calculate mitigation requirements.
v. Comments supporting the condition rating.

All of the trees were viewed while standing on the ground. The diameter was measured using a diameter tape. A probe was used to learn the depth of cavities. A mallet was used to sound the wood and listen for hollow spots.

Three Hundred Seventy Two (372) trees were listed as being of protected size. One hundred sixty two (162) trees were found to be in good or fair condition. Two hundred ten (210) trees were found to be in poor, very poor, or dead condition. The inspection data is shown on the attached 20 page spreadsheet.

Other testing or examination: No other testing or examination was agreed to as part of the inspection assignment.

Discussion: The Town's Tree Preservation Ordinance provided the requirements for data collection. Blue Oaks 4 inches diameter and greater, and Valley and Live Oaks 6 inches diameter and greater are considered Protected Trees.

A total of 372 trees were listed found to be of protected size. Of the 372 total trees, 210 trees were found to be in condition rating 2, 1, and 0, and do not require mitigation. Of the 210 trees, 168 trees were found to be in poor condition, a numerical 2 rating, considered major problems. Thirty eight (38) trees were found to be in very poor condition a 1 rating, considered extreme problems. Four (4) trees were found to be dead, a zero rating.

One hundred sixty two (162) trees were found to be in good and fair condition. Eight (8) trees were found to be in good condition, a 4 rating. Fifteen (15) #15 container size trees are required for mitigation. One hundred fifty four (154) trees were found to be in fair condition, a 3 rating. Two Hundred Seventy Five (275) #15 container size trees are required for mitigation. Per the Town's ordinance, a total of 290 #15 container size trees may be required to be planted on the site for mitigation.

Two (2) of the existing trees in good and fair condition were found to be blue oaks, and require higher mitgation planting. Eighty six (86) of the existing trees were found to be Live Oaks. Two hundred eighty four trees were found to be Valle Oaks.

The spreadsheet includes the tree map ID number, the tree tag number, common name, species, diameter at 4.5 measurement or other appropriate location, tree condition using the Town of Loomis 0-5 rating system, and comments with notes supporting the condition rating. The spreadsheet is sorted 3 ways, by tree tag number, tree condition to calculate mitigation planting, and by species.

Conclusion: Three hundred seventy two (372) trees were found to be of protected size. Of those trees, 162 were found to be in good and fair condition for a total mitigation planting requirement of potentially 290 #15 container trees. It should be possible to plant these trees on the property as part of the project landscape design and parking lot shade.

Certification: I certify that all the statements in this report are true, complete and correct to the best of my knowledge, and that all statements were made in good faith.

Please contact me at 650-740-3461 or at gordon@mannandtrees.com if you have any questions about this report or if additional services are desired.

Respectfully submitted,

Gordon Mann, Consulting Arborist
2011 ISA True Professional of Arboriculture
Registered Consulting Arborist #480
Certified Arborist #WE-0151AM
Certified Urban Forester #127
ISA TRAQ Qualified Tree Risk Assessor

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Attachments: Site image with tree ID numbers
Spreadsheet of trees sorted by tree number, species, and condition
KMZ file for aerial image with GPS coordinates

Assumptions and Limitations: This report provides information about the subject trees at the time of the inspection. Trees and conditions may change over time. This report is only valid for the conditions present at the time of the inspection. All observations were made while standing on the ground. The inspection consisted of visual observations. No further examinations were requested or performed.

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the options and recommendations of the arborist, or seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that can fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatments, pruning, and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, landlord-tenant matters, etc. Arborists cannot take such issues into account unless complete and accurate information is given to the arborist. The person hiring the arborist accepts full responsibility for authorizing the treatment options or remedial measures.

Trees can be managed, but they cannot be controlled. To live near a tree is to accept some degree of risk. The only way to eliminate all risks associated with trees is to eliminate all trees.

Item No.	Map Image #	Tree Number	Common Name Species	Diameter Inches	Condition	Comments	Mitigation
1	2 195	101	Valley Oak Quercus lobata	24	Fair	co-dom at 6'; unmaintained	
2	2 196	102	Interior Live Oak Quercus wislizenii	6	Major Problems	under #101; 3 leaders at base;	
3	2 197	103	Valley Oak Quercus lobata	11	Good	unpruned, straight co-domat 12'	
4	2 198	104	Interior Live Oak Quercus wislizenii	10	Fair	unmaintained low branches	
5	2 199	105	Valley Oak Quercus lobata	7	Fair	low branch at 5'; unmaintained	
6	2 200	106	Valley Oak Quercus lobata	9	Fair	2 small trees right next to, 1 undersized	
7	2 201	107	Valley Oak Quercus lobata	7	Major Problems	right next to 106	
8	2 202	108	Valley Oak Quercus lobata	7	Major Problems	severe lean west; 1-sided crown; right next to undersized valley & live; under 109	
9	2 203	109	Valley Oak Quercus lobata	11	Fair	between 108 & 110	
10	2 204	110	Valley Oak Quercus lobata	7	Fair	1-sided crown; next to undersized valley	
11	2 205	111	Valley Oak Quercus lobata	8	Fair	co-dom at 9'	
12	2 206	112	Valley Oak Quercus lobata	8	Fair	twig gall	
13	2 207	113	Interior Live Oak Quercus wislizenii	7	Fair	next to 115; 1-sided	
14	2 208	114	Interior Live Oak Quercus wislizenii	8	Extreme Problems	severe lean south; wounds	
15	2 209	115	Interior Live Oak Quercus wislizenii	9	Major Problems	right next to touching undersized valley; leann se	
16	2 210	116	Valley Oak Quercus lobata	11	Fair	unmaintained	

			Valley Oak			
17	2 211	117	Quercus lobata	7	Fair	undersized valley stem right next to base
			Valley Oak			surrounded by undersized 2 valley & 1 live;
18	2 212	118	Quercus lobata	7	Fair	1-sided crown
			Valley Oak			codom at 2'; leaders both have 1-sided
19	2 213	119	Quercus lobata	4	Major Problems	crowns; incl bark
			Interior Live Oak			
20	2 214	120	Quercus wislizenii	10	Fair	undersized valley to sw
			Valley Oak			
21	2 215	121	Quercus lobata	11	Fair	unmaintained
			Valley Oak			
22	2 216	122	Quercus lobata	7	Fair	co-dom at 6'; 3 leaders
			Valley Oak			
23	2 217	123	Quercus lobata	8	Fair	crowded narrow crown
			Valley Oak			co-dom at 7'; broken leadef;5.8" valley se
24	2 218	124	Quercus lobata	8	Major Problems	next to
			Valley Oak			leans north, 1-sided ctown; 4 undersized
25	2 219	125	Quercus lobata	9	Fair	trees nearby
			Valley Oak			co dom at 2'; incl bark; leaders lean
26	2 220	126	Quercus lobata	15	Major Problems	outward
			Valley Oak			
27	2 221	127	Quercus lobata	7	Fair	low lateral
			Valley Oak			
28	2 222	128	Quercus lobata	13	Fair	co dom at 10'l
			Valley Oak			co-dom at 5'; low lateral; flattened
29	2 223	129	Quercus lobata	14	Major Problems	circumference
			Valley Oak			
30	2 224	130	Quercus lobata	8	Fair	undersized live &valley at base
			Valley Oak			
31	2 225	131	Quercus lobata	15	Fair	co dom; wood nailed on trunk
			Valley Oak			
32	2 226	132	Quercus lobata	7	Fair	1-sided crown under133
			Interior Live Oak			
33	2 227	133	Quercus wislizenii	8	Extreme Problems	under #134; severe lean south; incl bark;
			Interior Live Oak			
34	2 228	134	Quercus wislizenii	18	Fair	low co-dom & laterals
			Valley Oak			
35	2 229	135	Quercus lobata	6	Fair	lean north

36	2	230	136	Interior Live Oak Quercus wislizenii	12	Fair	co-dom at 5';
37	2	231	137	Interior Live Oak Quercus wislizenii	16	Major Problems	co-dom at 2'; co dom at 9'; incl bark
38	2	232	138	Valley Oak Quercus lobata	10	Fair	1" live at base
39	2	233	139	Interior Live Oak Quercus wislizenii	15	Major Problems	co-dom at 2'; low laterals
40	2	234	140	Valley Oak Quercus lobata	10	Fair	lean ne
41	2	235	141	Valley Oak Quercus lobata	8	Fair	open growing
42	2	236	142	Valley Oak Quercus lobata	14	Fair	open growing
43	2	237	143	Valley Oak Quercus lobata	16	Major Problems	co-dom stems st base; crown under main canopy not countedin dia.; incl bark
44	2	238	144	Valley Oak Quercus lobata	15	Fair	low lateral; undersized live oaks near
45	2	239	145	Valley Oak Quercus lobata	7	Major Problems	1 sided crown to east; under 144
46	2	240	146	Valley Oak Quercus lobata	14	Fair	heavy twig gall
47	2	241	147	Valley Oak Quercus lobata	6	Fair	narrow upright crown
48	2	242	148	Interior Live Oak Quercus wislizenii	7	Major Problems	co dom at 4'; lean south; under 149
49	2	243	149	Valley Oak Quercus lobata	11	Extreme Problems	3 leacers at base; basal decay; stems lean outward
50	2	244	150	Interior Live Oak Quercus wislizenii	8	Major Problems	lean west
51	2	245	151	Valley Oak Quercus lobata	35	Fair	poison oak vines
52	2	246	152	Valley Oak Quercus lobata	20	Fair	slight lean south;

53	2	247	153	Valley Oak Quercus lobata	16	Fair	over 154
54	2	248	154	Interior Live Oak Quercus wislizenii	12	Extreme Problems	severe lean se; under 153 ; spur wounds on trunk
55	2	249	155	Valley Oak Quercus lobata	12	Extreme Problems	lean east; severe ivy vine
56	2	250	156	Valley Oak Quercus lobata	22	Major Problems	co-dom at 7'; severe ivy
57	2	251	157	Interior Live Oak Quercus wislizenii	0	Major Problems	co dom at base; under 158
58	2	252	158	Valley Oak Quercus lobata	13	Fair	low laterals
59	2	253	159	Valley Oak Quercus lobata	12	Fair	low lateral;
60	2	254	160	Interior Live Oak Quercus wislizenii	6	Major Problems	co-dom at base; under 159
61	2	255	161	Interior Live Oak Quercus wislizenii	12	Major Problems	2 leaders at base; lean; sunscald
62	2	256	162	Interior Live Oak Quercus wislizenii	16	Major Problems	co dom at base; basal decay; low co doms
63	2	257	163	Interior Live Oak Quercus wislizenii	9	Fair	live; low dieback
64	2	258	164	Valley Oak Quercus lobata	26	Major Problems	valley; co dom at 5'; 3 leaders; incl bark
65	2	259	165	Valley Oak Quercus lobata	19	Fair	open growing
66	2	260	166	Interior Live Oak Quercus wislizenii	7	Extreme Problems	severe leamn, suppressed
67	2	261	167	Interior Live Oak Quercus wislizenii	20	Extreme Problems	co-dom at base; split; incl bark; basal decay
68	2	262	168	Valley Oak Quercus lobata	12	Major Problems	co dom at 2'; incl bark; next to undersized valley to west

69	2	263	169	Valley Oak Quercus lobata	7	Major Problems	co dom at 1'; incl bark
70	2	264	170	Valley Oak Quercus lobata	16	Major Problems	co dom at 2'; 3 stems; incl bark
71	2	265	171	Interior Live Oak Quercus wislizenii	16	Extreme Problems	4 leaders at base lean outward; 16.16,8,10; basal decay
72	2	266	172	Valley Oak Quercus lobata	21	Fair	slight lean south;
73	2	267	173	Interior Live Oak Quercus wislizenii	7	Major Problems	under co dom 172; leanx south; basal sprouts
74	2	268	174	Interior Live Oak Quercus wislizenii	20	Major Problems	significant lean south; trunk decay
75	2	269	175	Interior Live Oak Quercus wislizenii	17	Major Problems	3 leaders at base; incl bark; 17,9,10; basal decay
76	2	270	176	Valley Oak Quercus lobata	11	Fair	lean sw
77	2	271	177	Valley Oak Quercus lobata	14	Major Problems	co dom at 8'; incl bark;
78	2	272	178	Valley Oak Quercus lobata	11	Fair	1 sided crown to east
79	2	273	179	Valley Oak Quercus lobata	11	Major Problems	co dom at 3'; lean sw
80	2	274	180	Valley Oak Quercus lobata	7	Major Problems	lean sw; basl decay
81	2	275	181	Interior Live Oak Quercus wislizenii	8	Major Problems	lean sw; large pruning wounds on trunk
82	2	276	182	Interior Live Oak Quercus wislizenii	7	Major Problems	extreme lean noth
83	2	277	183	Valley Oak Quercus lobata	10	Fair	straight leader
84	2	278	184	Interior Live Oak Quercus wislizenii	13	Major Problems	4 stems at base; stems lean outward; 13, 11,9,7
85	2	279	185	Valley Oak Quercus lobata	9	Fair	slight lean west

86	2	280	186	Valley Oak Quercus lobata	13	Fair	undersized valley between 185&&186
87	2	281	187	Valley Oak Quercus lobata	7	Fair	undersized valley south of
88	2	282	188	Valley Oak Quercus lobata	13	Major Problems	co dom at 3'; east leader significant lean
89	2	283	189	Valley Oak Quercus lobata	6	Fair	open growing
90	2	284	190	Valley Oak Quercus lobata	11	Fair	co dom at 7';
91	2	285	191	Valley Oak Quercus lobata	10	Major Problems	lean north ; decay fruitimg body om low trunk ptuning wound
92	2	286	192	Valley Oak Quercus lobata	12	Fair	live sprouts at base
93	2	287	193	Valley Oak Quercus lobata	13	Fair	co dom at 5'; low lateral;
94		1	194	Valley Oak Quercus lobata	7	Fair	next to 195; 1 sided crown
95		3	195	Valley Oak Quercus lobata	17	Fair	co dom at 6'; incl bark;
96		4	196	Valley Oak Quercus lobata	17	Extreme Problems	co dom at 2'; incl bark; dead leader; dieback
97		5	197	Valley Oak Quercus lobata	10	Fair	1 sided crown
98		6	198	Interior Live Oak Quercus wislizenii	0	Major Problems	co dom at base; 1-sided crown
99		7	199	Interior Live Oak Quercus wislizenii	0	Extreme Problems	co dom at 1'; basal decay at low trunk wound
100		8	200	Valley Oak Quercus lobata	14	Fair	symmetric crown
101		301	301	Valley Oak Quercus lobata	22	Fair	co dom at 5';
102		9	301	Valley Oak Quercus lobata	8	Fair	two trees received the 301 tag
103		10	302	Valley Oak Quercus lobata	20	Fair	symmetric crown
104		111	302	Valley Oak Quercus lobata	0	Extreme Problems	trunk decay; two trees received the 302 tag

105	11	303	Valley Oak Quercus lobata	14	Fair	
106	112	303	Valley Oak Quercus lobata	20	Fair	two trees received the 303 tag
107	12	304	Valley Oak Quercus lobata	12	Good	
108	13	305	Valley Oak Quercus lobata	0	Fair	crowded
109	14	306	Interior Live Oak Quercus wislizenii	8	Major Problems	lean se; basal decay
110	15	307	Valley Oak Quercus lobata	6	Major Problems	suppressed by 306
111	16	308	Valley Oak Quercus lobata	7	Fair	narrow crown
112	17	309	Valley Oak Quercus lobata	0	Major Problems	crowded by 308; 1 sided crown
113	18	310	Valley Oak Quercus lobata	8	Fair	
114	20	311	Valley Oak Quercus lobata	6	Major Problems	crowded between 310&312
115	21	312	Valley Oak Quercus lobata	8	Fair	
116	22	314	Valley Oak Quercus lobata	15	Good	
117	24	315	Valley Oak Quercus lobata	15	Good	
118	25	316	Valley Oak Quercus lobata	0	Major Problems	1 sided crown keans south
119	26	317	Valley Oak Quercus lobata	18	Major Problems	2 stems at base; leans east & west ; crowded with 316
120	27	318	Valley Oak Quercus lobata	14	Fair	open growimg
121	28	319	Valley Oak Quercus lobata	27	Fair	open growing
122	29	320	Valley Oak Quercus lobata	9	Fair	open growing
123	30	321	Valley Oak Quercus lobata	22	Good	open growing
124	31	322	Valley Oak Quercus lobata	13	Fair	

125	32	323	Valley Oak Quercus lobata	8	Extreme Problems	co-dom at base; incl bark; stems lean outward;
126	33	324	Valley Oak Quercus lobata	12	Fair	1 sided crown
127	34	324	Valley Oak Quercus lobata	0	Major Problems	revised 1 sided crown; leam east; liveoaks growing at base;
128	35	325	Valley Oak Quercus lobata	9	Fair	narrow 1 sided crown
129	36	326	Valley Oak Quercus lobata	13	Fair	co dom at 8';
130	37	327	Valley Oak Quercus lobata	13	Fair	co dom at 8';
131	38	328	Valley Oak Quercus lobata	16	Major Problems	line clearance pruned
132	39	329	Valley Oak Quercus lobata	15	Good	open growing
133	40	330	Valley Oak Quercus lobata	17	Fair	open growing
134	41	331	Valley Oak Quercus lobata	8	Major Problems	lean south;
135	42	332	Valley Oak Quercus lobata	13	Fair	co dom at 6';
136	43	333	Interior Live Oak Quercus wislizenii	10	Major Problems	ytunk wounds; trunk decay
137	44	333	Interior Live Oak Quercus wislizenii	10	Major Problems	ad on next to fallen live oak
138	45	334	Valley Oak Quercus lobata	18	Fair	open growing
139	46	335	Valley Oak Quercus lobata	12	Major Problems	severe lean west; soil piled at base;
140	47	336	Valley Oak Quercus lobata	10	Fair	growing on mound
141	48	337	Interior Live Oak Quercus wislizenii	0	Major Problems	low laterals; trunk wound
142	49	338	Valley Oak Quercus lobata	7	Fair	next to 339

143	50	339	Interior Live Oak Quercus wislizenii	7	Major Problems	too close to 338; lrans nw
144	51	340	Valley Oak Quercus lobata	6	Fair	o mound
145	52	341	Valley Oak Quercus lobata	12	Fair	lean west;
146	53	342	Valley Oak Quercus lobata	9	Good	
147	54	343	Valley Oak Quercus lobata	12	Fair	co dom
148	55	344	Valley Oak Quercus lobata	22	Good	open growing
149	56	345	Blue Oak Quercus douglasii	22	Fair	crowded with 344
150	57	346	Valley Oak Quercus lobata	14	Fair	open growing
151	58	347	Valley Oak Quercus lobata	23	Fair	lpw co dom open growing
152	59	348	Interior Live Oak Quercus wislizenii	24	Major Problems	co dom at 4'; basal decay; incl bark;
153	60	349	Valley Oak Quercus lobata	20	Fair	next to 350
154	61	350	Valley Oak Quercus lobata	14	Major Problems	lean west too close to 349
155	62	351	Valley Oak Quercus lobata	20	Fair	co dom at 8'; open growing
156	63	352	Valley Oak Quercus lobata	6	Fair	co dom at 6'; incl bark;
157	64	353	Valley Oak Quercus lobata	7	Major Problems	kink in trunk; co dom at 8';
158	65	354	Interior Live Oak Quercus wislizenii	10	Major Problems	lean away from 365
159	67	355	Valley Oak Quercus lobata	28	Fair	co dom at 3'; incl bark; over 9 small trees
160	68	356	Interior Live Oak Quercus wislizenii	8	Extreme Problems	2 stems at base; suppressed

161	69	357	Interior Live Oak Quercus wislizenii	0	Major Problems	suppressed by 355
162	72	358	Interior Live Oak Quercus wislizenii	6	Major Problems	crowded lean
163	73	359	Interior Live Oak Quercus wislizenii	6	Major Problems	crowded lean
164	70	360	Interior Live Oak Quercus wislizenii	8	Major Problems	lean south;
165	74	361	Valley Oak Quercus lobata	0	Major Problems	co dom at 2'; low lateral; lean north
166	75	362	Valley Oak Quercus lobata	13	Fair	lean east
167	76	363	Interior Live Oak Quercus wislizenii	20	Major Problems	co doms; basal decay low lateral;
168	77	364	Interior Live Oak Quercus wislizenii	7	Major Problems	crooked trunk
169	78	365	Valley Oak Quercus lobata	7	Major Problems	crooked trunk
170	79	366	Valley Oak Quercus lobata	7	Major Problems	lean south;
171	80	367	Interior Live Oak Quercus wislizenii	12	Major Problems	basal decay
172	81	368	Valley Oak Quercus lobata	34	Fair	codm at 3'
173	82	369	Interior Live Oak Quercus wislizenii	11	Major Problems	lean south;
174	83	370	Valley Oak Quercus lobata	16	Fair	
175	84	371	Interior Live Oak Quercus wislizenii	8	Major Problems	severe lean south;

176	85	372	Interior Live Oak Quercus wislizenii	8	Major Problems	severe lean south;
177	86	373	Interior Live Oak Quercus wislizenii	10	Major Problems	severe lean north
178	87	374	Valley Oak Quercus lobata	36	Fair	
179	88	375	Interior Live Oak Quercus wislizenii	7	Major Problems	lean west basal decay
180	89	376	Interior Live Oak Quercus wislizenii	14	Major Problems	lpw laterals; basal decay
181	90	377	Valley Oak Quercus lobata	12	Fair	slight lean south;
182	91	378	Interior Live Oak Quercus wislizenii	19	Extreme Problems	lean south; basal decay
183	92	379	Valley Oak Quercus lobata	12	Major Problems	dead leaders at base; severe lean south;
184	93	380	Interior Live Oak Quercus wislizenii	8	Major Problems	lean west
185	94	381	Valley Oak Quercus lobata	11	Fair	
186	95	382	Valley Oak Quercus lobata	7	Major Problems	growing too close to 381
187	96	383	Valley Oak Quercus lobata	28	Fair	open growing
188	97	384	Valley Oak Quercus lobata	10	Fair	
189	98	385	Valley Oak Quercus lobata	24	Fair	open growing
190	99	386	Valley Oak Quercus lobata	17	Major Problems	decay in trunk; tru k wounds co dom at 7'; o
191	100	387	Valley Oak Quercus lobata	12	Fair	open growing
192	101	388	Valley Oak Quercus lobata	18	Fair	open growing

193	102	389	Valley Oak Quercus lobata	18	Fair	co dom at 3'l open growing
194	103	390	Valley Oak Quercus lobata	22	Major Problems	trunk wounds low lateral;
195	104	391	Valley Oak Quercus lobata	12	Dead	trunk wounds bark falling off
196	105	392	Blue Oak Quercus douglasii	0	Fair	lean south; next to undersized valley
197	106	393	Valley Oak Quercus lobata	13	Fair	
198		394	Valley Oak Quercus lobata	10	Extreme Problems	bark falling off
199		395	Valley Oak Quercus lobata	20	Major Problems	trunk wounds; bowed trunk
200		396	Interior Live Oak Quercus wislizenii	10	Major Problems	lean east; basal decay
201	113	1501	Interior Live Oak Quercus wislizenii	8	Major Problems	basal decay
202	114	1502	Valley Oak Quercus lobata	6	Fair	
203	115	1503	Valley Oak Quercus lobata	12	Fair	low laterals
204	116	1504	Valley Oak Quercus lobata	6	Major Problems	lean west bowed trunk
205	117	1505	Valley Oak Quercus lobata	14	Fair	low lateral;
206	118	1506	Valley Oak Quercus lobata	17	Major Problems	3 leaders at base; lean south;
207	119	1507	Valley Oak Quercus lobata	20	Fair	co dom at 7';
208	120	1508	Valley Oak Quercus lobata	18	Major Problems	co dom at base; 13" second leader leans west
209	121	1509	Valley Oak Quercus lobata	8	Major Problems	swollen trunk; co dom at 5'
210	122	1510	Valley Oak Quercus lobata	7	Fair	
211	123	1511	Valley Oak Quercus lobata	7	Major Problems	co dom at 6'; incl lateral;

212	124	1512	Valley Oak Quercus lobata	12	Fair	
213	125	1513	Valley Oak Quercus lobata	11	Fair	
214	126	1514	Valley Oak Quercus lobata	14	Fair	1 sided crown 3 undersized to east
215	127	1515	Valley Oak Quercus lobata	14	Fair	
216	128	1516	Valley Oak Quercus lobata	15	Fair	open growing
217	129	1517	Valley Oak Quercus lobata	10	Fair	
218	130	1518	Valley Oak Quercus lobata	12	Dead	decay fruitimg body
219	131	1519	Valley Oak Quercus lobata	12	Fair	
220	132	1520	Interior Live Oak Quercus wislizenii	7	Major Problems	2 stems at base; basal decay
221	134	1521	Valley Oak Quercus lobata	8	Extreme Problems	severe trunk wound
222	135	1522	Valley Oak Quercus lobata	8	Major Problems	3 leaders at base; basal decay
223	136	1523	Valley Oak Quercus lobata	6	Major Problems	low trunk wound decay
224	138	1523	Valley Oak Quercus lobata	7	Extreme Problems	several stems at base; incl bark; ncl; 7,7,4,2,3
225	137	1524	Valley Oak Quercus lobata	6	Major Problems	2 stems at base; incl bark;
226	139	1526	Valley Oak Quercus lobata	6	Fair	dense grouping of undersized trees
227	140	1527	Valley Oak Quercus lobata	6	Major Problems	bowed trunk
228	142	1528	Interior Live Oak Quercus wislizenii	0	Extreme Problems	multi stems at base; basal decay
229	143	1529	Interior Live Oak Quercus wislizenii	7	Extreme Problems	multi stems at base; basal decay

230	144	1530	Interior Live Oak Quercus wislizenii	6,6,6,4		Extreme Problems	multi stems at base, basal decay
231	145	1531	Valley Oak Quercus lobata		8	Major Problems	4 stems at base - 6,6,5,2
232	147	1532	Valley Oak Quercus lobata		10	Major Problems	swollen trunk at base, laterals at base
233	146	1533	Valley Oak Quercus lobata		20	Extreme Problems	severe basal decay
234	148	1534	Valley Oak Quercus lobata		19	Major Problems	4 stems at base; 19,18, 18, 9. incl bark;
235	149	1535	Interior Live Oak Quercus wislizenii		8	Major Problems	multi stems at base; incl bark;
236	150	1536	Valley Oak Quercus lobata		10	Fair	
237	151	1537	Valley Oak Quercus lobata		12	Major Problems	co dom at 2'; lateral in crotvh
238	152	1538	Valley Oak Quercus lobata		23	Major Problems	basal decay
239	153	1539	Valley Oak Quercus lobata		19	Fair	
240	154	1540	Valley Oak Quercus lobata		9	Major Problems	overgrowwn, lean south;
241	155	1541	Valley Oak Quercus lobata		11	Major Problems	2 low codoms
242	156	1542	Valley Oak Quercus lobata		11	Major Problems	swollen trunk;, trunk wound
243	158	1543	Valley Oak Quercus lobata		13	Major Problems	overgrowwn leans east;
244	159	1544	Interior Live Oak Quercus wislizenii		23	Major Problems	multi leaders at 5'; basal decay
245	160	1545	Valley Oak Quercus lobata		9	Fair	open growing
246	161	1546	Valley Oak Quercus lobata		8	Fair	open growing on mound
247	162	1547	Valley Oak Quercus lobata		18	Fair	open growing
248	163	1548	Valley Oak Quercus lobata		8	Fair	barbed wire in tree

249	164	1549	Interior Live Oak Quercus wislizenii	6	Major Problems	basal decay
250	166	1550	Interior Live Oak Quercus wislizenii	8	Major Problems	low lateral; lean, basal decay
251	167	1551	Valley Oak Quercus lobata	8	Fair	crowded group
252	168	1552	Valley Oak Quercus lobata	6	Major Problems	bowed trunk
253	169	1553	Valley Oak Quercus lobata	12	Fair	
254	170	1554	Valley Oak Quercus lobata	10	Fair	
255	172	1555	Valley Oak Quercus lobata	14	Fair	co dom at 6';
256	173	1557	Valley Oak Quercus lobata	18	Fair	co dom at 10'
257	174	1558	Valley Oak Quercus lobata	12	Fair	
258	175	1559	Valley Oak Quercus lobata	8	Major Problems	crowded 1 sided crown
259	176	1560	Valley Oak Quercus lobata	10	Fair	
260	177	1561	Valley Oak Quercus lobata	9	Extreme Problems	trunk wound bark falling off
261	178	1562	Valley Oak Quercus lobata	11	Major Problems	co-dom at 1' leaning leaders
262	179	1563	Valley Oak Quercus lobata	10	Major Problems	co dom at 1'; incl bark;
263	180	1564	Valley Oak Quercus lobata	7	Fair	crowded
264	181	1565	Valley Oak Quercus lobata	9	Fair	
265	182	1566	Interior Live Oak Quercus wislizenii	7	Major Problems	basal decay
266	184	1567	Valley Oak Quercus lobata	8	Major Problems	co dom at 2'; incl bark;

267	185	1568	Interior Live Oak Quercus wislizenii	7	Major Problems	co dom at base; 1 stem suppressed
268	186	1569	Valley Oak Quercus lobata	8	Major Problems	lean, bowed trunk
269	189	1572	Valley Oak Quercus lobata	8	Fair	
270	190	1573	Valley Oak Quercus lobata	6	Major Problems	trunk wound
271	191	1574	Valley Oak Quercus lobata	9	Major Problems	3 leaders at base; 8,5,5; incl bark;
272	192	1575	Valley Oak Quercus lobata	8	Fair	crowded
273	193	1576	Valley Oak Quercus lobata	10	Fair	open growing
274	194	1577	Valley Oak Quercus lobata	16	Fair	open growing
275	288	1578	Valley Oak Quercus lobata	9	Major Problems	1 sided crown to west; >1/3 dieback
276	290	1579	Valley Oak Quercus lobata	14	Fair	symmetric crown
277	291	1580	Valley Oak Quercus lobata	14	Fair	lean se
278	292	1581	Valley Oak Quercus lobata	7	Major Problems	suppressed to south;
279	293	1582	Valley Oak Quercus lobata	7	Major Problems	crowded lean south;
280	295	1583	Valley Oak Quercus lobata	14	Fair	co dom at 5';
281	296	1584	Interior Live Oak Quercus wislizenii	16	Major Problems	base; basal
282	297	1585	Valley Oak Quercus lobata	6	Major Problems	suppressed by 1586
283	298	1586	Interior Live Oak Quercus wislizenii	16	Extreme Problems	basal and trunk decay
284	299	1587	Interior Live Oak Quercus wislizenii	23	Major Problems	basal decay co dom at 5'

285	300	1588	Interior Live Oak Quercus wislizenii	6	Extreme Problems	lean, basal decay
286	301	1589	Valley Oak Quercus lobata	16	Major Problems	co dom at 3', low lateral; incl bark;
287	302	1590	Interior Live Oak Quercus wislizenii	7	Major Problems	co dom at base; 2nd stem 7; lean south
288	303	1591	Interior Live Oak Quercus wislizenii	6	Extreme Problems	co dom at base; 5" other live stem; lean south;
289	304	1592	Valley Oak Quercus lobata	12	Fair	in blackberries
290	305	1593	Valley Oak Quercus lobata	16	Fair	open growing
291	306	1594	Valley Oak Quercus lobata	12	Fair	slight lean south;
292	307	1595	Valley Oak Quercus lobata	16	Fair	open growing
293	308	1596	Valley Oak Quercus lobata	8	Major Problems	3 leaders at base; 8, 8, 6; basal decay
294	309	1597	Valley Oak Quercus lobata	6	Major Problems	crowded lean south; laterals at base;
295	310	1598	Valley Oak Quercus lobata	6	Major Problems	2 stems at base; 6,6, sprouts at base;
296	311	1599	Interior Live Oak Quercus wislizenii	10	Extreme Problems	4 stems at base; basal decay all 10,4,6,8lean outward
297	312	1600	Interior Live Oak Quercus wislizenii	10	Extreme Problems	8 stems at base; 10, 4,5,2,7,6,8,7,5,5; basal decay
298	314	1601	Valley Oak Quercus lobata	6	Fair	twig gall
299	315	1602	Valley Oak Quercus lobata	8	Extreme Problems	3 stems at base; 8, 8,7; basal decay
300	316	1603	Valley Oak Quercus lobata	11	Major Problems	3 stems at base; 11,9,9; incl bark; lean outward;
301	317	1604	Valley Oak Quercus lobata	8	Major Problems	2 stems at base; 8,7; sprouts

			Interior Live Oak			
302	318	1605	Quercus wislizenii	7	Extreme Problems	3 stems at base; 6, 7,4; basal decay
			Valley Oak			
303	319	1606	Quercus lobata	6	Major Problems	3 stems at base; 6,4,4; incl bark;
			Valley Oak			
304	320	1607	Quercus lobata	7	Major Problems	2 stems at base; 7,4
			Valley Oak			
305	321	1608	Quercus lobata	8	Major Problems	low laterals
			Valley Oak			
306	322	1609	Quercus lobata	8	Major Problems	2 stems at base; 8,5
			Valley Oak			
307	323	1610	Quercus lobata	6	Major Problems	3 stems at base; 6,4,3
			Valley Oak			
308	324	1611	Quercus lobata	6	Major Problems	4 stems at base; 6,4,3,3
			Valley Oak			
309	325	1612	Quercus lobata	7	Fair	
			Valley Oak			
310	326	1613	Quercus lobata	8	Major Problems	2 stems at base 8,8
			Valley Oak			
311	327	1614	Quercus lobata	16	Major Problems	co dom at base; 12,12;1 leader leans north
			Valley Oak			
312	328	1615	Quercus lobata	7	Major Problems	2 stems at base; 7,6; incl bark;
			Valley Oak			
313	330	1616	Quercus lobata	14	Extreme Problems	2 stems at base; basal and trunk decay
			Valley Oak			
314	331	1617	Quercus lobata	12	Fair	
			Valley Oak			
315	332	1618	Quercus lobata	9	Major Problems	trunk wound; lean south; crowded
			Valley Oak			
316	333	1619	Quercus lobata	10	Major Problems	2 stems at base;
			Valley Oak			
317	334	1620	Quercus lobata	7	Major Problems	4 stems at base; 7,7,4,2; incl bark;
			Valley Oak			
318	335	1621	Quercus lobata	0	Fair	co dom at 7';
			Valley Oak			
319	336	1622	Quercus lobata	9	Major Problems	growing under power lines
			Valley Oak			
320	337	1623	Quercus lobata	9	Fair	
			Valley Oak			4 stems at base; 21,20,14,10; basal decay
321	338	1624	Quercus lobata	21	Major Problems	incl bark;

322	339	1625	Valley Oak Quercus lobata	7	Major Problems	suppressed by 1624
323	340	1626	Valley Oak Quercus lobata	12	Major Problems	suppressed by 1624; leans se
324	341	1627	Valley Oak Quercus lobata	8	Fair	low small lateral at base
325	342	1628	Valley Oak Quercus lobata	10	Fair	straight leader
326	343	1629	Valley Oak Quercus lobata	12	Fair	slight lean south;
327	344	1630	Interior Live Oak Quercus wislizenii	37	Extreme Problems	4 leaders at 2'; basal decay; incl bark; branch decay
328	345	1631	Valley Oak Quercus lobata	16	Fair	2 leaders at 2'; incl bark; lean west;
329	346	1632	Valley Oak Quercus lobata	17	Major Problems	low laterals; incl bark; lean outward;
330	347	1633	Valley Oak Quercus lobata	12	Fair	open growing
331	348	1634	Valley Oak Quercus lobata	14	Fair	open growing
332	349	1635	Valley Oak Quercus lobata	30	Major Problems	co dom at 5'; incl bark; lean west &south;
333	351	1636	Valley Oak Quercus lobata	8	Major Problems	lean south; bowed leaders
334	352	1637	Valley Oak Quercus lobata	8	Fair	crowded
335	353	1638	Valley Oak Quercus lobata	14	Major Problems	1 sided crown to west, leans west
336	354	1639	Valley Oak Quercus lobata	0	Major Problems	suppressed to west
337	355	1640	Valley Oak Quercus lobata	14	Major Problems	co dom at 6'; incl bark; lean south
338	356	1641	Valley Oak Quercus lobata	7	Major Problems	suppressed to west
339	357	1642	Valley Oak Quercus lobata	7	Major Problems	crowded leans se
340	358	1643	Valley Oak Quercus lobata	13	Major Problems	lean west; >30% dieback
341	359	1645	Valley Oak Quercus lobata	14	Major Problems	severe lean west; bowed trunk

342	360	1646	Valley Oak Quercus lobata	7	Major Problems	suppressed
343	361	1647	Interior Live Oak Quercus wislizenii	7	Major Problems	suppressed west
344	362	1648	Valley Oak Quercus lobata	0	Major Problems	dieback
345	363	1649	Valley Oak Quercus lobata	9	Major Problems	dieback
346	364	1650	Interior Live Oak Quercus wislizenii	14	Major Problems	co dom at 1'; dieback
347	365	1651	Valley Oak Quercus lobata	0	Major Problems	suppressed se
348	366	1652	Interior Live Oak Quercus wislizenii	12	Extreme Problems	2 stems at base; 12, 8; dying
349	367	1653	Valley Oak Quercus lobata	9	Major Problems	suppressed west
350	368	1654	Valley Oak Quercus lobata	12	Major Problems	lean west;
351	369	1655	Interior Live Oak Quercus wislizenii	6	Dead	
352	370	1656	Valley Oak Quercus lobata	12	Major Problems	suppressed to west
353	371	1657	Valley Oak Quercus lobata	11	Major Problems	suppressed to west
354	372	1658	Valley Oak Quercus lobata	6	Major Problems	crowded lean west
355	373	1659	Interior Live Oak Quercus wislizenii	24	Dead	
356	375	1660	Valley Oak Quercus lobata	30	Fair	lean north; base buried by duff and broken btanches
357	376	1661	Valley Oak Quercus lobata	24	Extreme Problems	decay, bark missing on norh trunk, bowed trunk
358	377	1662	Interior Live Oak Quercus wislizenii	14	Extreme Problems	under power lines; 3 stems at base; 14, 9,9

359	378	1663	Interior Live Oak Quercus wislizenii	0	Extreme Problems	under power lines, 2 stems at base; 12, 9
360	380	1665	Valley Oak Quercus lobata	14	Extreme Problems	under power lines ; topped
361	381	1666	Valley Oak Quercus lobata	18	Extreme Problems	under power lines, topped
362	382	1667	Valley Oak Quercus lobata	22	Major Problems	lean west; basal decay
363	383	1668	Valley Oak Quercus lobata	20	Major Problems	ivy on trunk; dieback
364	1670	1670	Interior Live Oak Quercus wislizenii	38	Major Problems	Multi-leaders at base, included bark, basal decay, low laterals, crossing branches
365	1671	1671	Interior Live Oak Quercus wislizenii	10	Fair	co-dom, low laterals
366	1672	1672	Interior Live Oak Quercus wislizenii	9	Major Problems	suppressed, growing at base of 1673
367	1673	1673	Valley Oak Quercus lobata	13,14,14,17	Extreme Problems	4 leaders at base, next to 1672, included bark, basal decay, ourward leaning leaders
368	1674	1674	Interior Live Oak Quercus wislizenii	11	Major Problems	low co-dom at 1', overgrown by 1673
369	1675	1675	Valley Oak Quercus lobata	5.4	Major Problems	Undersized, crowded, 1-sided crown
370	1676	1676	Valley Oak Quercus lobata	16 at 1'	Major Problems	co-doms at 1', included bark
371	1677	1677	Valley Oak Quercus lobata	17	Major Problems	co-doms at 6', heavy line clearance pruned
372	1678	1678	Valley Oak Quercus lobata	14	Major Problems	Line clearance pruned, suppressed leader
373	1679	1679	Valley Oak Quercus lobata	9	Fair	under power lines, smaller diameter branches and minimal line clearance pruned, not to standard stubs

Item No.	Map Image #	Tree Number	Common Name Species	Diameter Inches	Condition	Comments	Mitigation
1	2 195	101	Valley Oak Quercus lobata	24	Fair	co-dom at 6'; unmaintained	
2	2 196	102	Interior Live Oak Quercus wislizenii	6	Major Problems	under #101; 3 leaders at base;	
3	2 197	103	Valley Oak Quercus lobata	11	Good	unpruned, straight co-domat 12'	
4	2 198	104	Interior Live Oak Quercus wislizenii	10	Fair	unmaintained low branches	
5	2 199	105	Valley Oak Quercus lobata	7	Fair	low branch at 5'; unmaintained	
6	2 200	106	Valley Oak Quercus lobata	9	Fair	2 small trees right next to, 1 undersized	
7	2 201	107	Valley Oak Quercus lobata	7	Major Problems	right next to 106	
8	2 202	108	Valley Oak Quercus lobata	7	Major Problems	severe lean west; 1-sided crown; right next to undersized valley & live; under 109	
9	2 203	109	Valley Oak Quercus lobata	11	Fair	between 108 & 110	
10	2 204	110	Valley Oak Quercus lobata	7	Fair	1-sided crown; next to undersized valley	
11	2 205	111	Valley Oak Quercus lobata	8	Fair	co-dom at 9'	
12	2 206	112	Valley Oak Quercus lobata	8	Fair	twig gall	
13	2 207	113	Interior Live Oak Quercus wislizenii	7	Fair	next to 115; 1-sided	
14	2 208	114	Interior Live Oak Quercus wislizenii	8	Extreme Problems	severe lean south; wounds	
15	2 209	115	Interior Live Oak Quercus wislizenii	9	Major Problems	right next to touching undersized valley; leann se	
16	2 210	116	Valley Oak Quercus lobata	11	Fair	unmaintained	

			Valley Oak			
17	2 211	117	Quercus lobata	7	Fair	undersized valley stem right next to base
			Valley Oak			surrounded by undersized 2 valley & 1 live;
18	2 212	118	Quercus lobata	7	Fair	1-sided crown
			Valley Oak			codom at 2'; leaders both have 1-sided
19	2 213	119	Quercus lobata	4	Major Problems	crowns; incl bark
			Interior Live Oak			
20	2 214	120	Quercus wislizenii	10	Fair	undersized valley to sw
			Valley Oak			
21	2 215	121	Quercus lobata	11	Fair	unmaintained
			Valley Oak			
22	2 216	122	Quercus lobata	7	Fair	co-dom at 6'; 3 leaders
			Valley Oak			
23	2 217	123	Quercus lobata	8	Fair	crowded narrow crown
			Valley Oak			co-dom at 7'; broken leadef;5.8" valley se
24	2 218	124	Quercus lobata	8	Major Problems	next to
			Valley Oak			leans north, 1-sided ctown; 4 undersized
25	2 219	125	Quercus lobata	9	Fair	trees nearby
			Valley Oak			co dom at 2'; incl bark; leaders lean
26	2 220	126	Quercus lobata	15	Major Problems	outward
			Valley Oak			
27	2 221	127	Quercus lobata	7	Fair	low lateral
			Valley Oak			
28	2 222	128	Quercus lobata	13	Fair	co dom at 10'l
			Valley Oak			co-dom at 5'; low lateral; flattened
29	2 223	129	Quercus lobata	14	Major Problems	circumference
			Valley Oak			
30	2 224	130	Quercus lobata	8	Fair	undersized live &valley at base
			Valley Oak			
31	2 225	131	Quercus lobata	15	Fair	co dom; wood nailed on trunk
			Valley Oak			
32	2 226	132	Quercus lobata	7	Fair	1-sided crown under133
			Interior Live Oak			
33	2 227	133	Quercus wislizenii	8	Extreme Problems	under #134; severe lean south; incl bark;
			Interior Live Oak			
34	2 228	134	Quercus wislizenii	18	Fair	low co-dom & laterals
			Valley Oak			
35	2 229	135	Quercus lobata	6	Fair	lean north

36	2	230	136	Interior Live Oak Quercus wislizenii	12	Fair	co-dom at 5';
37	2	231	137	Interior Live Oak Quercus wislizenii	16	Major Problems	co-dom at 2'; co dom at 9'; incl bark
38	2	232	138	Valley Oak Quercus lobata	10	Fair	1" live at base
39	2	233	139	Interior Live Oak Quercus wislizenii	15	Major Problems	co-dom at 2'; low laterals
40	2	234	140	Valley Oak Quercus lobata	10	Fair	lean ne
41	2	235	141	Valley Oak Quercus lobata	8	Fair	open growing
42	2	236	142	Valley Oak Quercus lobata	14	Fair	open growing
43	2	237	143	Valley Oak Quercus lobata	16	Major Problems	co-dom stems st base; crown under main canopy not countedin dia.; incl bark
44	2	238	144	Valley Oak Quercus lobata	15	Fair	low lateral; undersized live oaks near
45	2	239	145	Valley Oak Quercus lobata	7	Major Problems	1 sided crown to east; under 144
46	2	240	146	Valley Oak Quercus lobata	14	Fair	heavy twig gall
47	2	241	147	Valley Oak Quercus lobata	6	Fair	narrow upright crown
48	2	242	148	Interior Live Oak Quercus wislizenii	7	Major Problems	co dom at 4'; lean south; under 149
49	2	243	149	Valley Oak Quercus lobata	11	Extreme Problems	3 leacers at base; basal decay; stems lean outward
50	2	244	150	Interior Live Oak Quercus wislizenii	8	Major Problems	lean west
51	2	245	151	Valley Oak Quercus lobata	35	Fair	poison oak vines
52	2	246	152	Valley Oak Quercus lobata	20	Fair	slight lean south;

53	2	247	153	Valley Oak Quercus lobata	16	Fair	over 154
54	2	248	154	Interior Live Oak Quercus wislizenii	12	Extreme Problems	severe lean se; under 153 ; spur wounds on trunk
55	2	249	155	Valley Oak Quercus lobata	12	Extreme Problems	lean east; severe ivy vine
56	2	250	156	Valley Oak Quercus lobata	22	Major Problems	co-dom at 7'; severe ivy
57	2	251	157	Interior Live Oak Quercus wislizenii	0	Major Problems	co dom at base; under 158
58	2	252	158	Valley Oak Quercus lobata	13	Fair	low laterals
59	2	253	159	Valley Oak Quercus lobata	12	Fair	low lateral;
60	2	254	160	Interior Live Oak Quercus wislizenii	6	Major Problems	co-dom at base; under 159
61	2	255	161	Interior Live Oak Quercus wislizenii	12	Major Problems	2 leaders at base; lean; sunscald
62	2	256	162	Interior Live Oak Quercus wislizenii	16	Major Problems	co dom at base; basal decay; low co doms
63	2	257	163	Interior Live Oak Quercus wislizenii	9	Fair	live; low dieback
64	2	258	164	Valley Oak Quercus lobata	26	Major Problems	valley; co dom at 5'; 3 leaders; incl bark
65	2	259	165	Valley Oak Quercus lobata	19	Fair	open growing
66	2	260	166	Interior Live Oak Quercus wislizenii	7	Extreme Problems	severe leamn, suppressed
67	2	261	167	Interior Live Oak Quercus wislizenii	20	Extreme Problems	co-dom at base; split; incl bark; basal decay
68	2	262	168	Valley Oak Quercus lobata	12	Major Problems	co dom at 2'; incl bark; next to undersized valley to west

69	2	263	169	Valley Oak Quercus lobata	7	Major Problems	co dom at 1'; incl bark
70	2	264	170	Valley Oak Quercus lobata	16	Major Problems	co dom at 2'; 3 stems; incl bark
71	2	265	171	Interior Live Oak Quercus wislizenii	16	Extreme Problems	4 leaders at base lean outward; 16.16,8,10; basal decay
72	2	266	172	Valley Oak Quercus lobata	21	Fair	slight lean south;
73	2	267	173	Interior Live Oak Quercus wislizenii	7	Major Problems	under co dom 172; leanx south; basal sprouts
74	2	268	174	Interior Live Oak Quercus wislizenii	20	Major Problems	significant lean south; trunk decay
75	2	269	175	Interior Live Oak Quercus wislizenii	17	Major Problems	3 leaders at base; incl bark; 17,9,10; basal decay
76	2	270	176	Valley Oak Quercus lobata	11	Fair	lean sw
77	2	271	177	Valley Oak Quercus lobata	14	Major Problems	co dom at 8'; incl bark;
78	2	272	178	Valley Oak Quercus lobata	11	Fair	1 sided crown to east
79	2	273	179	Valley Oak Quercus lobata	11	Major Problems	co dom at 3'; lean sw
80	2	274	180	Valley Oak Quercus lobata	7	Major Problems	lean sw; basl decay
81	2	275	181	Interior Live Oak Quercus wislizenii	8	Major Problems	lean sw; large pruning wounds on trunk
82	2	276	182	Interior Live Oak Quercus wislizenii	7	Major Problems	extreme lean noth
83	2	277	183	Valley Oak Quercus lobata	10	Fair	straight leader
84	2	278	184	Interior Live Oak Quercus wislizenii	13	Major Problems	4 stems at base; stems lean outward; 13, 11,9,7
85	2	279	185	Valley Oak Quercus lobata	9	Fair	slight lean west

86	2	280	186	Valley Oak Quercus lobata	13	Fair	undersized valley between 185&&186
87	2	281	187	Valley Oak Quercus lobata	7	Fair	undersized valley south of
88	2	282	188	Valley Oak Quercus lobata	13	Major Problems	co dom at 3'; east leader significant lean
89	2	283	189	Valley Oak Quercus lobata	6	Fair	open growing
90	2	284	190	Valley Oak Quercus lobata	11	Fair	co dom at 7';
91	2	285	191	Valley Oak Quercus lobata	10	Major Problems	lean north ; decay fruitimg body om low trunk ptuning wound
92	2	286	192	Valley Oak Quercus lobata	12	Fair	live sprouts at base
93	2	287	193	Valley Oak Quercus lobata	13	Fair	co dom at 5'; low lateral;
94		1	194	Valley Oak Quercus lobata	7	Fair	next to 195; 1 sided crown
95		3	195	Valley Oak Quercus lobata	17	Fair	co dom at 6'; incl bark;
96		4	196	Valley Oak Quercus lobata	17	Extreme Problems	co dom at 2'; incl bark; dead leader; dieback
97		5	197	Valley Oak Quercus lobata	10	Fair	1 sided crown
98		6	198	Interior Live Oak Quercus wislizenii	0	Major Problems	co dom at base; 1-sided crown
99		7	199	Interior Live Oak Quercus wislizenii	0	Extreme Problems	co dom at 1'; basal decay at low trunk wound
100		8	200	Valley Oak Quercus lobata	14	Fair	symmetric crown
101		301	301	Valley Oak Quercus lobata	22	Fair	co dom at 5';
102		9	301	Valley Oak Quercus lobata	8	Fair	two trees received the 301 tag
103		10	302	Valley Oak Quercus lobata	20	Fair	symmetric crown
104		111	302	Valley Oak Quercus lobata	0	Extreme Problems	trunk decay; two trees received the 302 tag

105	11	303	Valley Oak Quercus lobata	14	Fair	
106	112	303	Valley Oak Quercus lobata	20	Fair	two trees received the 303 tag
107	12	304	Valley Oak Quercus lobata	12	Good	
108	13	305	Valley Oak Quercus lobata	0	Fair	crowded
109	14	306	Interior Live Oak Quercus wislizenii	8	Major Problems	lean se; basal decay
110	15	307	Valley Oak Quercus lobata	6	Major Problems	suppressed by 306
111	16	308	Valley Oak Quercus lobata	7	Fair	narrow crown
112	17	309	Valley Oak Quercus lobata	0	Major Problems	crowded by 308; 1 sided crown
113	18	310	Valley Oak Quercus lobata	8	Fair	
114	20	311	Valley Oak Quercus lobata	6	Major Problems	crowded between 310&312
115	21	312	Valley Oak Quercus lobata	8	Fair	
116	22	314	Valley Oak Quercus lobata	15	Good	
117	24	315	Valley Oak Quercus lobata	15	Good	
118	25	316	Valley Oak Quercus lobata	0	Major Problems	1 sided crown keans south
119	26	317	Valley Oak Quercus lobata	18	Major Problems	2 stems at base; leans east & west ; crowded with 316
120	27	318	Valley Oak Quercus lobata	14	Fair	open growimg
121	28	319	Valley Oak Quercus lobata	27	Fair	open growing
122	29	320	Valley Oak Quercus lobata	9	Fair	open growing
123	30	321	Valley Oak Quercus lobata	22	Good	open growing
124	31	322	Valley Oak Quercus lobata	13	Fair	

125	32	323	Valley Oak Quercus lobata	8	Extreme Problems	co-dom at base; incl bark; stems lean outward;
126	33	324	Valley Oak Quercus lobata	12	Fair	1 sided crown
127	34	324	Valley Oak Quercus lobata	0	Major Problems	revised 1 sided crown; leam east; liveoaks growing at base;
128	35	325	Valley Oak Quercus lobata	9	Fair	narrow 1 sided crown
129	36	326	Valley Oak Quercus lobata	13	Fair	co dom at 8';
130	37	327	Valley Oak Quercus lobata	13	Fair	co dom at 8';
131	38	328	Valley Oak Quercus lobata	16	Major Problems	line clearance pruned
132	39	329	Valley Oak Quercus lobata	15	Good	open growing
133	40	330	Valley Oak Quercus lobata	17	Fair	open growing
134	41	331	Valley Oak Quercus lobata	8	Major Problems	lean south;
135	42	332	Valley Oak Quercus lobata	13	Fair	co dom at 6';
136	43	333	Interior Live Oak Quercus wislizenii	10	Major Problems	ytunk wounds; trunk decay
137	44	333	Interior Live Oak Quercus wislizenii	10	Major Problems	ad on next to fallen live oak
138	45	334	Valley Oak Quercus lobata	18	Fair	open growing
139	46	335	Valley Oak Quercus lobata	12	Major Problems	severe lean west; soil piled at base;
140	47	336	Valley Oak Quercus lobata	10	Fair	growing on mound
141	48	337	Interior Live Oak Quercus wislizenii	0	Major Problems	low laterals; trunk wound
142	49	338	Valley Oak Quercus lobata	7	Fair	next to 339

143	50	339	Interior Live Oak Quercus wislizenii	7	Major Problems	too close to 338; lrans nw
144	51	340	Valley Oak Quercus lobata	6	Fair	o mound
145	52	341	Valley Oak Quercus lobata	12	Fair	lean west;
146	53	342	Valley Oak Quercus lobata	9	Good	
147	54	343	Valley Oak Quercus lobata	12	Fair	co dom
148	55	344	Valley Oak Quercus lobata	22	Good	open growing
149	56	345	Blue Oak Quercus douglasii	22	Fair	crowded with 344
150	57	346	Valley Oak Quercus lobata	14	Fair	open growing
151	58	347	Valley Oak Quercus lobata	23	Fair	lpw co dom open growing
152	59	348	Interior Live Oak Quercus wislizenii	24	Major Problems	co dom at 4'; basal decay; incl bark;
153	60	349	Valley Oak Quercus lobata	20	Fair	next to 350
154	61	350	Valley Oak Quercus lobata	14	Major Problems	lean west too close to 349
155	62	351	Valley Oak Quercus lobata	20	Fair	co dom at 8'; open growing
156	63	352	Valley Oak Quercus lobata	6	Fair	co dom at 6'; incl bark;
157	64	353	Valley Oak Quercus lobata	7	Major Problems	kink in trunk; co dom at 8';
158	65	354	Interior Live Oak Quercus wislizenii	10	Major Problems	lean away from 365
159	67	355	Valley Oak Quercus lobata	28	Fair	co dom at 3'; incl bark; over 9 small trees
160	68	356	Interior Live Oak Quercus wislizenii	8	Extreme Problems	2 stems at base; suppressed

161	69	357	Interior Live Oak Quercus wislizenii	0	Major Problems	suppressed by 355
162	72	358	Interior Live Oak Quercus wislizenii	6	Major Problems	crowded lean
163	73	359	Interior Live Oak Quercus wislizenii	6	Major Problems	crowded lean
164	70	360	Interior Live Oak Quercus wislizenii	8	Major Problems	lean south;
165	74	361	Valley Oak Quercus lobata	0	Major Problems	co dom at 2'; low lateral; lean north
166	75	362	Valley Oak Quercus lobata	13	Fair	lean east
167	76	363	Interior Live Oak Quercus wislizenii	20	Major Problems	co doms; basal decay low lateral;
168	77	364	Interior Live Oak Quercus wislizenii	7	Major Problems	crooked trunk
169	78	365	Valley Oak Quercus lobata	7	Major Problems	crooked trunk
170	79	366	Valley Oak Quercus lobata	7	Major Problems	lean south;
171	80	367	Interior Live Oak Quercus wislizenii	12	Major Problems	basal decay
172	81	368	Valley Oak Quercus lobata	34	Fair	codm at 3'
173	82	369	Interior Live Oak Quercus wislizenii	11	Major Problems	lean south;
174	83	370	Valley Oak Quercus lobata	16	Fair	
175	84	371	Interior Live Oak Quercus wislizenii	8	Major Problems	severe lean south;

176	85	372	Interior Live Oak Quercus wislizenii	8	Major Problems	severe lean south;
177	86	373	Interior Live Oak Quercus wislizenii	10	Major Problems	severe lean north
178	87	374	Valley Oak Quercus lobata	36	Fair	
179	88	375	Interior Live Oak Quercus wislizenii	7	Major Problems	lean west basal decay
180	89	376	Interior Live Oak Quercus wislizenii	14	Major Problems	lpw laterals; basal decay
181	90	377	Valley Oak Quercus lobata	12	Fair	slight lean south;
182	91	378	Interior Live Oak Quercus wislizenii	19	Extreme Problems	lean south; basal decay
183	92	379	Valley Oak Quercus lobata	12	Major Problems	dead leaders at base; severe lean south;
184	93	380	Interior Live Oak Quercus wislizenii	8	Major Problems	lean west
185	94	381	Valley Oak Quercus lobata	11	Fair	
186	95	382	Valley Oak Quercus lobata	7	Major Problems	growing too close to 381
187	96	383	Valley Oak Quercus lobata	28	Fair	open growing
188	97	384	Valley Oak Quercus lobata	10	Fair	
189	98	385	Valley Oak Quercus lobata	24	Fair	open growing
190	99	386	Valley Oak Quercus lobata	17	Major Problems	decay in trunk; tru k wounds co dom at 7'; o
191	100	387	Valley Oak Quercus lobata	12	Fair	open growing
192	101	388	Valley Oak Quercus lobata	18	Fair	open growing

193	102	389	Valley Oak Quercus lobata	18	Fair	co dom at 3'l open growing
194	103	390	Valley Oak Quercus lobata	22	Major Problems	trunk wounds low lateral;
195	104	391	Valley Oak Quercus lobata	12	Dead	trunk wounds bark falling off
196	105	392	Blue Oak Quercus douglasii	0	Fair	lean south; next to undersized valley
197	106	393	Valley Oak Quercus lobata	13	Fair	
198		394	Valley Oak Quercus lobata	10	Extreme Problems	bark falling off
199		395	Valley Oak Quercus lobata	20	Major Problems	trunk wounds; bowed trunk
200		396	Interior Live Oak Quercus wislizenii	10	Major Problems	lean east; basal decay
201	113	1501	Interior Live Oak Quercus wislizenii	8	Major Problems	basal decay
202	114	1502	Valley Oak Quercus lobata	6	Fair	
203	115	1503	Valley Oak Quercus lobata	12	Fair	low laterals
204	116	1504	Valley Oak Quercus lobata	6	Major Problems	lean west bowed trunk
205	117	1505	Valley Oak Quercus lobata	14	Fair	low lateral;
206	118	1506	Valley Oak Quercus lobata	17	Major Problems	3 leaders at base; lean south;
207	119	1507	Valley Oak Quercus lobata	20	Fair	co dom at 7';
208	120	1508	Valley Oak Quercus lobata	18	Major Problems	co dom at base; 13" second leader leans west
209	121	1509	Valley Oak Quercus lobata	8	Major Problems	swollen trunk; co dom at 5'
210	122	1510	Valley Oak Quercus lobata	7	Fair	
211	123	1511	Valley Oak Quercus lobata	7	Major Problems	co dom at 6'; incl lateral;

212	124	1512	Valley Oak Quercus lobata	12	Fair	
213	125	1513	Valley Oak Quercus lobata	11	Fair	
214	126	1514	Valley Oak Quercus lobata	14	Fair	1 sided crown 3 undersized to east
215	127	1515	Valley Oak Quercus lobata	14	Fair	
216	128	1516	Valley Oak Quercus lobata	15	Fair	open growing
217	129	1517	Valley Oak Quercus lobata	10	Fair	
218	130	1518	Valley Oak Quercus lobata	12	Dead	decay fruitimg body
219	131	1519	Valley Oak Quercus lobata	12	Fair	
220	132	1520	Interior Live Oak Quercus wislizenii	7	Major Problems	2 stems at base; basal decay
221	134	1521	Valley Oak Quercus lobata	8	Extreme Problems	severe trunk wound
222	135	1522	Valley Oak Quercus lobata	8	Major Problems	3 leaders at base; basal decay
223	136	1523	Valley Oak Quercus lobata	6	Major Problems	low trunk wound decay
224	138	1523	Valley Oak Quercus lobata	7	Extreme Problems	several stems at base; incl bark; ncl; 7,7,4,2,3
225	137	1524	Valley Oak Quercus lobata	6	Major Problems	2 stems at base; incl bark;
226	139	1526	Valley Oak Quercus lobata	6	Fair	dense grouping of undersized trees
227	140	1527	Valley Oak Quercus lobata	6	Major Problems	bowed trunk
228	142	1528	Interior Live Oak Quercus wislizenii	0	Extreme Problems	multi stems at base; basal decay
229	143	1529	Interior Live Oak Quercus wislizenii	7	Extreme Problems	multi stems at base; basal decay

230	144	1530	Interior Live Oak Quercus wislizenii	6,6,6,4		Extreme Problems	multi stems at base, basal decay
231	145	1531	Valley Oak Quercus lobata		8	Major Problems	4 stems at base - 6,6,5,2
232	147	1532	Valley Oak Quercus lobata		10	Major Problems	swollen trunk at base, laterals at base
233	146	1533	Valley Oak Quercus lobata		20	Extreme Problems	severe basal decay
234	148	1534	Valley Oak Quercus lobata		19	Major Problems	4 stems at base; 19,18, 18, 9. incl bark;
235	149	1535	Interior Live Oak Quercus wislizenii		8	Major Problems	multi stems at base; incl bark;
236	150	1536	Valley Oak Quercus lobata		10	Fair	
237	151	1537	Valley Oak Quercus lobata		12	Major Problems	co dom at 2'; lateral in crotvh
238	152	1538	Valley Oak Quercus lobata		23	Major Problems	basal decay
239	153	1539	Valley Oak Quercus lobata		19	Fair	
240	154	1540	Valley Oak Quercus lobata		9	Major Problems	overgrowwn, lean south;
241	155	1541	Valley Oak Quercus lobata		11	Major Problems	2 low codoms
242	156	1542	Valley Oak Quercus lobata		11	Major Problems	swollen trunk;, trunk wound
243	158	1543	Valley Oak Quercus lobata		13	Major Problems	overgrowwn leans east;
244	159	1544	Interior Live Oak Quercus wislizenii		23	Major Problems	multi leaders at 5'; basal decay
245	160	1545	Valley Oak Quercus lobata		9	Fair	open growing
246	161	1546	Valley Oak Quercus lobata		8	Fair	open growing on mound
247	162	1547	Valley Oak Quercus lobata		18	Fair	open growing
248	163	1548	Valley Oak Quercus lobata		8	Fair	barbed wire in tree

249	164	1549	Interior Live Oak Quercus wislizenii	6	Major Problems	basal decay
250	166	1550	Interior Live Oak Quercus wislizenii	8	Major Problems	low lateral; lean, basal decay
251	167	1551	Valley Oak Quercus lobata	8	Fair	crowded group
252	168	1552	Valley Oak Quercus lobata	6	Major Problems	bowed trunk
253	169	1553	Valley Oak Quercus lobata	12	Fair	
254	170	1554	Valley Oak Quercus lobata	10	Fair	
255	172	1555	Valley Oak Quercus lobata	14	Fair	co dom at 6';
256	173	1557	Valley Oak Quercus lobata	18	Fair	co dom at 10'
257	174	1558	Valley Oak Quercus lobata	12	Fair	
258	175	1559	Valley Oak Quercus lobata	8	Major Problems	crowded 1 sided crown
259	176	1560	Valley Oak Quercus lobata	10	Fair	
260	177	1561	Valley Oak Quercus lobata	9	Extreme Problems	trunk wound bark falling off
261	178	1562	Valley Oak Quercus lobata	11	Major Problems	co-dom at 1' leaning leaders
262	179	1563	Valley Oak Quercus lobata	10	Major Problems	co dom at 1'; incl bark;
263	180	1564	Valley Oak Quercus lobata	7	Fair	crowded
264	181	1565	Valley Oak Quercus lobata	9	Fair	
265	182	1566	Interior Live Oak Quercus wislizenii	7	Major Problems	basal decay
266	184	1567	Valley Oak Quercus lobata	8	Major Problems	co dom at 2'; incl bark;

267	185	1568	Interior Live Oak Quercus wislizenii	7	Major Problems	co dom at base; 1 stem suppressed
268	186	1569	Valley Oak Quercus lobata	8	Major Problems	lean, bowed trunk
269	189	1572	Valley Oak Quercus lobata	8	Fair	
270	190	1573	Valley Oak Quercus lobata	6	Major Problems	trunk wound
271	191	1574	Valley Oak Quercus lobata	9	Major Problems	3 leaders at base; 8,5,5; incl bark;
272	192	1575	Valley Oak Quercus lobata	8	Fair	crowded
273	193	1576	Valley Oak Quercus lobata	10	Fair	open growing
274	194	1577	Valley Oak Quercus lobata	16	Fair	open growing
275	288	1578	Valley Oak Quercus lobata	9	Major Problems	1 sided crown to west; >1/3 dieback
276	290	1579	Valley Oak Quercus lobata	14	Fair	symmetric crown
277	291	1580	Valley Oak Quercus lobata	14	Fair	lean se
278	292	1581	Valley Oak Quercus lobata	7	Major Problems	suppressed to south;
279	293	1582	Valley Oak Quercus lobata	7	Major Problems	crowded lean south;
280	295	1583	Valley Oak Quercus lobata	14	Fair	co dom at 5';
281	296	1584	Interior Live Oak Quercus wislizenii	16	Major Problems	base; basal
282	297	1585	Valley Oak Quercus lobata	6	Major Problems	suppressed by 1586
283	298	1586	Interior Live Oak Quercus wislizenii	16	Extreme Problems	basal and trunk decay
284	299	1587	Interior Live Oak Quercus wislizenii	23	Major Problems	basal decay co dom at 5'

285	300	1588	Interior Live Oak Quercus wislizenii	6	Extreme Problems	lean, basal decay
286	301	1589	Valley Oak Quercus lobata	16	Major Problems	co dom at 3', low lateral; incl bark;
287	302	1590	Interior Live Oak Quercus wislizenii	7	Major Problems	co dom at base; 2nd stem 7; lean south
288	303	1591	Interior Live Oak Quercus wislizenii	6	Extreme Problems	co dom at base; 5" other live stem; lean south;
289	304	1592	Valley Oak Quercus lobata	12	Fair	in blackberries
290	305	1593	Valley Oak Quercus lobata	16	Fair	open growing
291	306	1594	Valley Oak Quercus lobata	12	Fair	slight lean south;
292	307	1595	Valley Oak Quercus lobata	16	Fair	open growing
293	308	1596	Valley Oak Quercus lobata	8	Major Problems	3 leaders at base; 8, 8, 6; basal decay
294	309	1597	Valley Oak Quercus lobata	6	Major Problems	crowded lean south; laterals at base;
295	310	1598	Valley Oak Quercus lobata	6	Major Problems	2 stems at base; 6,6, sprouts at base;
296	311	1599	Interior Live Oak Quercus wislizenii	10	Extreme Problems	4 stems at base; basal decay all 10,4,6,8lean outward
297	312	1600	Interior Live Oak Quercus wislizenii	10	Extreme Problems	8 stems at base; 10, 4,5,2,7,6,8,7,5,5; basal decay
298	314	1601	Valley Oak Quercus lobata	6	Fair	twig gall
299	315	1602	Valley Oak Quercus lobata	8	Extreme Problems	3 stems at base; 8, 8,7; basal decay
300	316	1603	Valley Oak Quercus lobata	11	Major Problems	3 stems at base; 11,9,9; incl bark; lean outward;
301	317	1604	Valley Oak Quercus lobata	8	Major Problems	2 stems at base; 8,7; sprouts

			Interior Live Oak			
302	318	1605	Quercus wislizenii	7	Extreme Problems	3 stems at base; 6, 7,4; basal decay
			Valley Oak			
303	319	1606	Quercus lobata	6	Major Problems	3 stems at base; 6,4,4; incl bark;
			Valley Oak			
304	320	1607	Quercus lobata	7	Major Problems	2 stems at base; 7,4
			Valley Oak			
305	321	1608	Quercus lobata	8	Major Problems	low laterals
			Valley Oak			
306	322	1609	Quercus lobata	8	Major Problems	2 stems at base; 8,5
			Valley Oak			
307	323	1610	Quercus lobata	6	Major Problems	3 stems at base; 6,4,3
			Valley Oak			
308	324	1611	Quercus lobata	6	Major Problems	4 stems at base; 6,4,3,3
			Valley Oak			
309	325	1612	Quercus lobata	7	Fair	
			Valley Oak			
310	326	1613	Quercus lobata	8	Major Problems	2 stems at base 8,8
			Valley Oak			
311	327	1614	Quercus lobata	16	Major Problems	co dom at base; 12,12;1 leader leans north
			Valley Oak			
312	328	1615	Quercus lobata	7	Major Problems	2 stems at base; 7,6; incl bark;
			Valley Oak			
313	330	1616	Quercus lobata	14	Extreme Problems	2 stems at base; basal and trunk decay
			Valley Oak			
314	331	1617	Quercus lobata	12	Fair	
			Valley Oak			
315	332	1618	Quercus lobata	9	Major Problems	trunk wound; lean south; crowded
			Valley Oak			
316	333	1619	Quercus lobata	10	Major Problems	2 stems at base;
			Valley Oak			
317	334	1620	Quercus lobata	7	Major Problems	4 stems at base; 7,7,4,2; incl bark;
			Valley Oak			
318	335	1621	Quercus lobata	0	Fair	co dom at 7';
			Valley Oak			
319	336	1622	Quercus lobata	9	Major Problems	growing under power lines
			Valley Oak			
320	337	1623	Quercus lobata	9	Fair	
			Valley Oak			4 stems at base; 21,20,14,10; basal decay
321	338	1624	Quercus lobata	21	Major Problems	incl bark;

322	339	1625	Valley Oak Quercus lobata	7	Major Problems	suppressed by 1624
323	340	1626	Valley Oak Quercus lobata	12	Major Problems	suppressed by 1624; leans se
324	341	1627	Valley Oak Quercus lobata	8	Fair	low small lateral at base
325	342	1628	Valley Oak Quercus lobata	10	Fair	straight leader
326	343	1629	Valley Oak Quercus lobata	12	Fair	slight lean south;
327	344	1630	Interior Live Oak Quercus wislizenii	37	Extreme Problems	4 leaders at 2'; basal decay; incl bark; branch decay
328	345	1631	Valley Oak Quercus lobata	16	Fair	2 leaders at 2'; incl bark; lean west;
329	346	1632	Valley Oak Quercus lobata	17	Major Problems	low laterals; incl bark; lean outward;
330	347	1633	Valley Oak Quercus lobata	12	Fair	open growing
331	348	1634	Valley Oak Quercus lobata	14	Fair	open growing
332	349	1635	Valley Oak Quercus lobata	30	Major Problems	co dom at 5'; incl bark; lean west &south;
333	351	1636	Valley Oak Quercus lobata	8	Major Problems	lean south; bowed leaders
334	352	1637	Valley Oak Quercus lobata	8	Fair	crowded
335	353	1638	Valley Oak Quercus lobata	14	Major Problems	1 sided crown to west, leans west
336	354	1639	Valley Oak Quercus lobata	0	Major Problems	suppressed to west
337	355	1640	Valley Oak Quercus lobata	14	Major Problems	co dom at 6'; incl bark; lean south
338	356	1641	Valley Oak Quercus lobata	7	Major Problems	suppressed to west
339	357	1642	Valley Oak Quercus lobata	7	Major Problems	crowded leans se
340	358	1643	Valley Oak Quercus lobata	13	Major Problems	lean west; >30% dieback
341	359	1645	Valley Oak Quercus lobata	14	Major Problems	severe lean west; bowed trunk

342	360	1646	Valley Oak Quercus lobata	7	Major Problems	suppressed
343	361	1647	Interior Live Oak Quercus wislizenii	7	Major Problems	suppressed west
344	362	1648	Valley Oak Quercus lobata	0	Major Problems	dieback
345	363	1649	Valley Oak Quercus lobata	9	Major Problems	dieback
346	364	1650	Interior Live Oak Quercus wislizenii	14	Major Problems	co dom at 1'; dieback
347	365	1651	Valley Oak Quercus lobata	0	Major Problems	suppressed se
348	366	1652	Interior Live Oak Quercus wislizenii	12	Extreme Problems	2 stems at base; 12, 8; dying
349	367	1653	Valley Oak Quercus lobata	9	Major Problems	suppressed west
350	368	1654	Valley Oak Quercus lobata	12	Major Problems	lean west;
351	369	1655	Interior Live Oak Quercus wislizenii	6	Dead	
352	370	1656	Valley Oak Quercus lobata	12	Major Problems	suppressed to west
353	371	1657	Valley Oak Quercus lobata	11	Major Problems	suppressed to west
354	372	1658	Valley Oak Quercus lobata	6	Major Problems	crowded lean west
355	373	1659	Interior Live Oak Quercus wislizenii	24	Dead	
356	375	1660	Valley Oak Quercus lobata	30	Fair	lean north; base buried by duff and broken btanches
357	376	1661	Valley Oak Quercus lobata	24	Extreme Problems	decay, bark missing on norh trunk, bowed trunk
358	377	1662	Interior Live Oak Quercus wislizenii	14	Extreme Problems	under power lines; 3 stems at base; 14, 9,9

359	378	1663	Interior Live Oak Quercus wislizenii	0	Extreme Problems	under power lines, 2 stems at base; 12, 9
360	380	1665	Valley Oak Quercus lobata	14	Extreme Problems	under power lines ; topped
361	381	1666	Valley Oak Quercus lobata	18	Extreme Problems	under power lines, topped
362	382	1667	Valley Oak Quercus lobata	22	Major Problems	lean west; basal decay
363	383	1668	Valley Oak Quercus lobata	20	Major Problems	ivy on trunk; dieback
364	1670	1670	Interior Live Oak Quercus wislizenii	38	Major Problems	Multi-leaders at base, included bark, basal decay, low laterals, crossing branches
365	1671	1671	Interior Live Oak Quercus wislizenii	10	Fair	co-dom, low laterals
366	1672	1672	Interior Live Oak Quercus wislizenii	9	Major Problems	suppressed, growing at base of 1673
367	1673	1673	Valley Oak Quercus lobata	13,14,14,17	Extreme Problems	4 leaders at base, next to 1672, included bark, basal decay, ourward leaning leaders
368	1674	1674	Interior Live Oak Quercus wislizenii	11	Major Problems	low co-dom at 1', overgrown by 1673
369	1675	1675	Valley Oak Quercus lobata	5.4	Major Problems	Undersized, crowded, 1-sided crown
370	1676	1676	Valley Oak Quercus lobata	16 at 1'	Major Problems	co-doms at 1', included bark
371	1677	1677	Valley Oak Quercus lobata	17	Major Problems	co-doms at 6', heavy line clearance pruned
372	1678	1678	Valley Oak Quercus lobata	14	Major Problems	Line clearance pruned, suppressed leader
373	1679	1679	Valley Oak Quercus lobata	9	Fair	under power lines, smaller diameter branches and minimal line clearance pruned, not to standard stubs

ATTACHMENT 4

Wetland Delineation for the 17.88 Sierra-Brace Study Area, Town of Loomis, Placer County, California, prepared by Salix Consulting, Inc. May 2016.

WETLAND DELINEATION
FOR THE

±17.88-ACRE SIERRA-BRACE STUDY AREA

TOWN OF LOOMIS, PLACER COUNTY, CALIFORNIA

Prepared for:

MANIKAS PROPERTIES
1817 Maryal Drive, Suite 100
Sacramento, CA 95864

Prepared by:

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12240 Herdal Drive, Ste. 14,
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(530) 888-0130

MAY 2016

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Appendix A. Wetland Data Sheets
Appendix B. Wetland Status of Plant Species Observed in the Sierra-Brace Study Area
Appendix C. USACOE Aquatic Resource Spreadsheet

ATTACHMENT

Attachment 1. USACOE Verification letter dated March 2009

WETLAND DELINEATION
FOR THE
±17.88-ACRE SIERRA-BRACE STUDY AREA

INTRODUCTION

On behalf of Manikas Properties, Salix Consulting, Inc., is submitting this updated delineation of waters of the United States for the ±17.88-acre Sierra-Brace study area in the Town of Loomis, Placer County, California. The property was originally delineated by North Fork Associates in February 2008 and verified by the Corps March 20, 2009 (SPK-2008-00630). This document largely includes the original delineation documentation and mapping, with minor adjustments, as needed.

The study area is located north of Interstate 80, in the southeastern corner of the intersection between Sierra College Boulevard and Brace Road. The location corresponds to Section 28 of Township 11 North and Range 7 East on the 7.5 minute Rocklin, CA United States Geological Survey (USGS) quadrangle (Figure 1). The latitude and longitude of the approximate center of the site are 38°48'34"North and 121°12'16" West. The Assessor Parcel Numbers (APNs) are 045-042-011, 045-042-012, 045-042-023, 045-042-034, 045-042-035, 045-042-036, and 045-042-037.

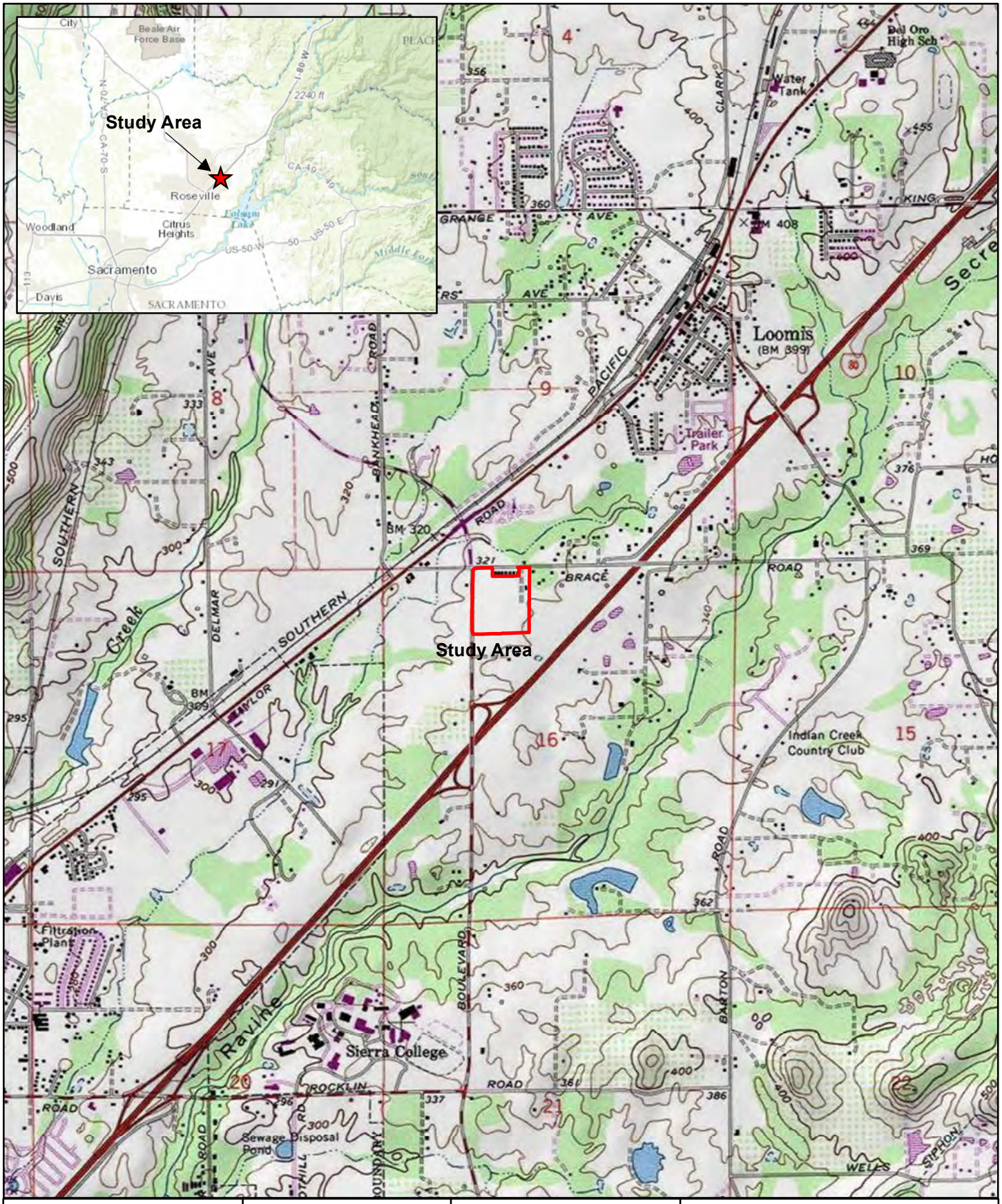
The study area is located at an elevation between approximately 320 and 340 feet. Habitats in the study area include annual grassland and foothill woodland. Adjacent land uses include a multi-family residential building along the northern boundary the Homewood Lumber complex to the north, single family residential to the east, commercial and undeveloped land to the south, and an office building and undeveloped land to the west (Figure 2). The study area is bounded by Brace Road to the north and Sierra College Boulevard to the west.

Background

As noted above, waters of the U.S. were delineated by North Fork Associates in February 2008 and verified by the U.S. Army Corps of Engineers March 20, 2009. The verification was valid for five years from the date of the letter. The 2009 verification letter is included as Attachment 1, following the Appendices. Property ownership has changed since that time, and this report is intended to update that delineation.

Directions to the Site

From Sacramento, proceed east on Interstate 80. Take the Sierra College Boulevard exit and turn left after exiting the freeway. The Brace Road and Sierra College Boulevard intersection is just north of Interstate 80. The study area is located in the southeastern corner of the intersection.



Salix consulting, inc.

N

0 1,000 2,000

Feet

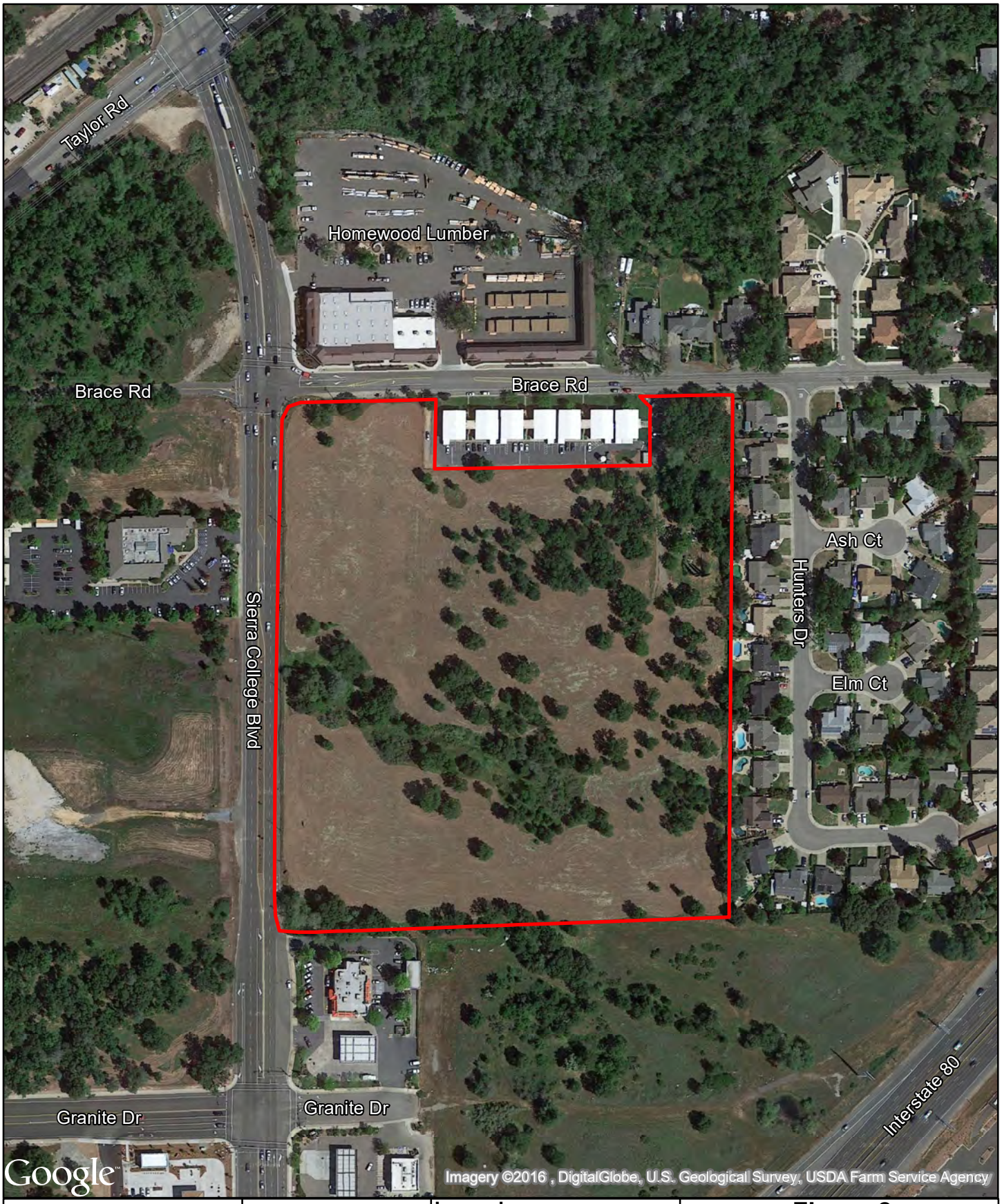
Source Maps: USGS Topographic Map
Rocklin Quad 1:24,000
Section: 16
Township: 11N
Range: 7E

Figure 1

SITE AND VICINITY MAP

Sierra-Brace

City of Rocklin, Placer County, CA



Salix consulting, inc.

N

0 125 250

Feet

Legend

Study Area (±18.27 acres)

Figure 2

AERIAL MAP

Sierra-Brace

City of Rocklin, Placer County, CA

CONTACT INFORMATION

Property Owner:
Manikas Properties
1817 Maryal Drive, Suite 100
Sacramento, CA 95864
(916) 847-5090
Contact: John T. Manikas

Delineator:
Salix Consulting, Inc.
12240 Herdal Drive, Ste. 14
Auburn, California 95603
Phone: (530) 888-0130
Contact: Jeff Glazner

METHODS

Waters of the United States were assessed on March 25, 2016, by Jeff Glazner and Hunter Gallant. The North Fork delineation was uploaded to the submeter GPS and field checked. Very minor adjustments were made and are reflected in the map provided in this document. The original topographic basemap was used for the revised map as new topo was not available. The original data forms are included in Appendix A. The plant list for the site is included as Appendix B.

RESULTS

Climate

The region has a Mediterranean climate with dry hot summers and mild winters. Over the course of a year, average high temperatures typically vary from 54°F in the winter to around 92°F in the summer. The warm season lasts from May through September, with an average daily high temperature above 88°F. On average, the hottest months are July and August with an average high of 92°F and low of 61°F. The coolest months are December and January, with an average daily high temperature around 54°F and average low temperature around 40°F. Precipitation occurs mostly from November through April in the form of rain, averaging around 25 inches per year. Little or no precipitation falls during June, July, and August.

Precipitation occurred 3 days prior to the March 25, 2016, field visit, amounting to one-half an inch of rainfall.

Soils

One soil unit is mapped in the study area (Figure 3): Andregg coarse sandy loam, 2 to 9 percent slopes.

Andregg soils on-site are coarse-loamy Ultic Haploxerolls, which are Mollisols formed in a Mediterranean climate and characterized by little subsoil development. This component is on foothills, hills with slopes of 2 to 9 percent. They are derived from weathered granodiorite, and bedrock is 29 to 33 inches below the surface. The A horizon extends to about 15 inches and the BA horizon to about 24 inches. Hues range from 10YR to 2.5YR; values between 5 and 2; and chromas between 3 and 2, moist. Organic matter at the surface horizon is around 2 percent. Andregg soils are well-

Salix consulting, inc.

N

0 100 200

Feet

Legend

Study Area (±18.27 acres)

Figure 3

SOIL COMPONENTS MAP

Sierra-Brace

City of Rocklin, Placer County, CA

drained and have moderately rapid permeability. This soil is neither ponded nor flooded. This soil does not meet hydric criteria.

Hydrology

The Sierra-Brace study area is located in the Lower American watershed (Hydrologic Unit Code 18020111). The topography of the study area gently slopes to the west. The wetland swale and drainage ditch located in the southwest corner of the site drain water westerly and convey water offsite through culverts underneath Sierra College Boulevard. Water continues to drain westerly on the adjacent property and drains into Sucker Ravine which drains into Secret Ravine. Secret Ravine is a tributary of Miners Ravine, which ultimately reaches Dry Creek and then the American River. The constructed drainage in the northeastern corner conveys storm water and urban runoff from the residential development to the east through a storm drain system.

Vegetation

Two biological communities were identified within the study area: foothill woodland and annual grassland. The site wetlands are embedded in these habitats. Figures 4a and 4b. provides photos of the site taken during the March 25, 2016, site visit.

Foothill Woodland

The foothill woodland varies in density throughout the site, being mostly open, and it is dominated by valley oak and interior live oak with a few scattered foothill pines. Shrubs in the understory vary from dense stands of coyote brush and Himalayan blackberry to a completely absent shrub layer. The herbaceous layer consists of a mixture of non-native grasses and forbs. Grasses include Italian ryegrass, ripgut grass, and soft chess. Forbs present include Italian thistle, California mugwort, field hedge-parsley, klamathweed, broad leaf filaree, common vetch, and crane's-bill geranium.

The wetland swale in the study area occurs within the foothill woodland habitat. A few Fremont cottonwood, narrow-leaved willow, and arroyo willow occur within the shrub understory. The herbaceous understory includes curly dock, Mexican rush, Iris-leaf rush, tall flatsedge, and prickly lettuce.

Annual Grassland

The non-native grasses and forbs that occur in the foothill woodland also occur in the annual grassland in the study area. Other grasses and forbs present in the annual grassland include wild oat, hedgehog dogtail, foxtail barley, medusahead, yellow star-thistle, rose clover, smooth's cat-ear, common fiddleneck, short-podded mustard, and bindweed. The annual grassland onsite appears to be disked annually.

1. Culvert carrying flows to the west from WS-1 under Sierra College Boulevard. *Photo date: 3-25-16*

2. Looking upslope along WS-1. *Photo date: 3-25-16*

Salix consulting, inc.

Figure 4a

SITE PHOTOS

Sierra-Brace

City of Rocklin, Placer County, CA

1. Looking at southwest corner of property at culvert carrying flows of WS-3 to the west under Sierra College Blvd. *Photo date: 3-25-16*

2. Looking west over outfall of WS-2.
Photo date: 3-25-16

Salix consulting, inc.

Figure 4b

SITE PHOTOS

Sierra-Brace

City of Rocklin, Placer County, CA

Waters of the United States

One category of waters of the United States was mapped on the site: wetland swale. Table 1 provides an acreage summary of the wetland swales. The wetland delineation map is included in Figure 5. GIS data is provided on the accompanying DVD, and the Corps of Engineers Aquatic Resources spreadsheet is included as Appendix C.

Table 1.
Waters of the United States within the Sierra-Brace Study Area

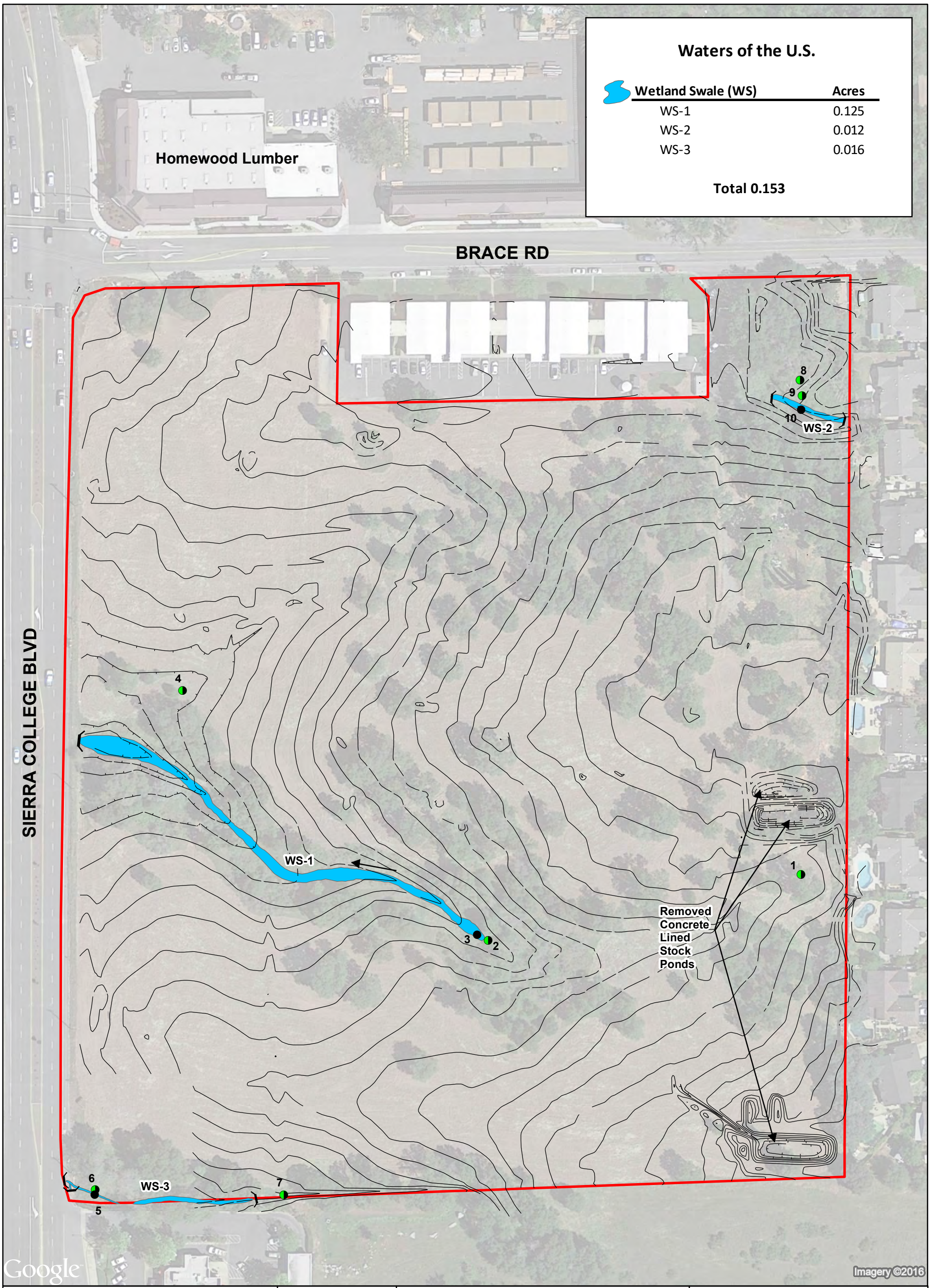
Type	Acreage
Wetlands:	
Wetland swale	
WS-1	0.125
WS-2	0.012
WS-3	0.016
Total Waters of the United States	**0.153**

Wetland Swale

One wetland swale occurs within the foothill woodland habitat (Figure 4a). This swale (WS-1) begins in the middle of the study area, where it collects surface water (in the form of sheet flow) and then drains westerly, where it then exits the study area through a culvert underneath Sierra College Boulevard. The beginning of the swale is a small open area dominated by iris leaf rush. The swale then continues west through a dense patch of coyote brush and opens up again near the culvert adjacent to Sierra College Boulevard. Wetland plant species such as hyssop loosestrife, curly dock, prickly lettuce, Italian ryegrass, and Mexican rush are present within the lower portion of the swale.

A second wetland swale (WS-2) enters the study area through a culvert along the eastern boundary in the northeast corner of the study area. The swale appears to convey stormwater runoff and urban water westerly for approximately 80 feet within the study area, and then exits the study area through a culvert underneath Starlight Lane. The swale is densely vegetated with Himalayan blackberry (Figure 4b).

A third swale (WS-3) occurs in the southwestern corner of the study area, where stormwater runoff drains onto the study area through an 18-inch PVC culvert located on the commercial development (McDonald's/Chevron) to the south. Wetland species such as water plantain, veronica, moth mullein, water cress, and curly dock are present. The swale (WS-3) continues for approximately 175 feet west until it merges with a narrower excavated ditch that drains water from a 12-inch concrete culvert located under the commercial development to the south (Figure 4b). Water exits the study area along the western boundary through a 30-inch corrugated metal pipe culvert under Sierra College Boulevard.



Prepared By:

Salix consulting, inc.

Prepared For:
Manikas Properties
1817 Maryal Drive, Suite 100
Sacramento, CA 95864

N

0 50 100
Feet

Legend

- Study Area (±18.20 acres)
- Culvert
- Wetland Data Point
- Upland Data Point

USACE REGULATORY FILE#: SPK-2008-00630
DATE OF VERIFICATION: March 20, 2009

NOTES: Revised wetland delineation conducted March 2016. Original delineation conducted by Pat Britton and Barry Anderson of North Fork Associates in 2007.

Figure 5

WETLAND DELINEATION

Sierra-Brace

Town of Loomis, Placer County, CA

April 18, 2016

Former Cattle Watering Holes

According to historic information, three concrete-lined livestock ponds once existed onsite and these ponds had been directly connected to a well and pump that had been abandoned, and that they had been filled for safety reasons, utilizing a grading permit issued by the Town of Loomis (#5475). Because we are using the old topographic mapping, the concrete depressions appear on the map. These areas are now leveled ground.

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Appendix A.
Wetland Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 1
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus lobata*	30	☒	FAC
2.		☐	
3.		☐	
4.		☐	
Total Cover:	30		
Sapling/Shrub Stratum			
1.. *Rubus discolor*	5	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	5	☐	
Herb Stratum			
1. *Lolium multiflorum*	40	☒	FAC
2. *Unknown grass*	20	☒	FAC
3. *Rumex crispus*	10	☐	FACW-
4. *Vicia sativa*	5	☐	FACU
5. *Galium aparine*	5	☐	FACU
6. *Geranium molle*	5	☐	-
7. *Cyperus eragrostis*	1	☐	FACW
8.		☐	
Total Cover:	86		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5 YR 4/2	100					Coarse sandy loam	
4-5	10 YR 4/2	100					Coarse sandy loam	
5-9	10 YR 3/1	90	7.5 YR 3/3	10	C	M	Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:
At 6 inches deep within the soil profile, there appears to be a red band.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):	
Water Table Present?	Yes ☐	No ☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches):	

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Lacks evidence of wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 2
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Upland comparison point to data point #3.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Bromus hordeaceus*	40	☒	FACU-
2. *Bromus diandrus*	40	☒	-
3. *Geranium molle*	15	☐	-
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	95		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5 YR 2/2	100					Coarse sandy loam	
2-14	10 YR 3/1	100					Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches):

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 3
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

Is the Sampled Area within a Wetland? **Yes** ☒ **No** ☐

Remarks:
Wetland swale.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Juncus xiphioides*	90	☒	OBL
2. *Geranium molle*	10	☐	-
3. *Rumex crispus*	5	☐	FACW-
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	105		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 2/2	100					Coarse sandy loam	
2-14	10 YR 4/1	100					Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Low chroma, soils are hydric based on the Corps 1987 Manual.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):		
Water Table Present?	Yes ☐	No ☐	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches):	17 in	**Wetland Hydrology Present Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 4
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Bromus hordeaceus*	30	☒	FACU-
2. *Hordeum murinum*	30	☒	-
3. *Trifolium hirtum*	20	☒	-
4. *Lolium multiflorum*	10	☐	FAC
5. *Geranium molle*	5	☐	-
6.		☐	
7.		☐	
8.		☐	
Total Cover:	95		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≥3.0[1]
- ☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:
Recently plowed.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/2	100					Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____ **Wetland Hydrology Present Yes** ☐ **No** ☒

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 5
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Ditch that drains storm water runoff. Drains for a short distance on the site and leaves via a 30 inch culvert under Sierra College Boulevard.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Juncus xiphioides*	20	☒	OBL
2. *Juncus mexicanus*	10	☒	FACW
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	30		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: 70 % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:
Recently cleared.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5 YR 2.5/1	100					Coarse sandy loam	
4-12	10 YR 4/1	90	7.5 YR 4/6	10	C	M	Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____ **Wetland Hydrology Present Yes** ☒ **No** ☐

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: State: CA Sampling Point: 6
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Upland comparison point to data point #5.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	20	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	20	☐	
Herb Stratum			
1. *Geranium molle*	15	☒	-
2. *Bromus hordeaceus*	10	☒	-
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	25		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: 20 % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3
Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 3/2	100					Coarse sandy loam	
4-12	10 YR 3/2	98	10 YR 3/3	2	C	M	Loamy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____ **Wetland Hydrology Present Yes** ☐ **No** ☒

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 7
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5%
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Upland swale.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Bromus diandrus*	40	☒	-
2. *Bromus hordeaceus*	40	☒	FACU-
3. *Epilobium brachycarpum*	20	☐	-
4. *Veronica sp.*	10	☐	Varies
5. *Vicia sativa*	5	☐	FACU
6. *Torilis arvensis*	5	☐	-
7.		☐	
8.		☐	
Total Cover:	120		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 3/2	100					Loam	
8-12	7.5 YR 4/2	100					Sandy	Sand mixed with soil, multi-colored

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/27/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 8
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): None Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	100	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	100	☐	
Herb Stratum			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:			
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 3/2	100					Loamy	
6-12	7.5 YR 3/2	50	10 YR 4/3	50			Coarse loam	Chunks of decomposed granite mixed in soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:
Soil profile may consist of mixed soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/27/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 9
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	100	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	100	☐	
Herb Stratum			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:			
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/2	100					Coarse loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches):

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/27/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 10
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

Is the Sampled Area within a Wetland? **Yes** ☒ **No** ☐

Remarks:
Drainage ditch

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	100	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	100	☐	
Herb Stratum			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:			
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:
Rubus over ditch/stream.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 3/1	100					Sandy loam	
4-12	2.5 Y 5/3	90	2.5 Y 5.5/1				Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☒	No ☐	Depth (inches):	1"
Water Table Present?	Yes ☐	No ☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches):	0

Wetland Hydrology Present Yes ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix B.
Wetland Status of Plant Species Observed in the Sierra-Brace Study Area

Appendix B. Wetland Status of Plant Species Observed

Taxon	Common Name	Wetland Status
Acacia baileyana	Cootamundra wattle	UPL
Acmispon americanus var. americanus	Spanish-clover	UPL
Alisma triviale	California water plantain	OBL
Amsinckia menziesii	Rancher's fireweed	UPL
Artemisia douglasiana	California mugwort	FAC
Arundo donax	Giant reed	FACW
Avena fatua	Wild oat	UPL
Baccharis pilularis	Coyote brush	UPL
Briza minor	Small quaking grass	FAC
Bromus diandrus	Ripgut grass	UPL
Bromus hordeaceus	Soft chess	FACU
Carduus pycnocephalus	Italian thistle	UPL
Centaurea solstitialis	Yellow starthistle	UPL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canada thistle	FACU
Clarkia sp.	Clarkia	UPL
Claytonia perfoliata	Common miner's lettuce	FAC
Convolvulus arvensis	Bindweed	UPL
Cynodon dactylon	Bermudagrass	FACU
Cynosurus echinatus	Hedgehog dogtail	UPL
Cyperus eragrostis	Tall flatsedge	FACW
Cytisus scoparius	Scotch broom	UPL
Elymus caput-medusae	Medusahead	UPL
Epilobium brachycarpum	Summer cottonweed	UPL
Erigeron canadensis	Canadian horseweed	FACU
Erodium botrys	Broad-leaf filaree	FACU
Erodium cicutarium	Red-stem filaree	UPL
Eschscholzia californica	California poppy	UPL
Festuca perennis	Italian ryegrass	FAC
Galium aparine	Goose grass	FACU
Geranium dissectum	Cut-leaf geranium	UPL
Geranium molle	Dove's-foot geranium	UPL
Hirschfeldia incana	Short-podded mustard	UPL
Hordeum marinum subsp. gussoneanum	Mediterranean barley	FAC
Hordeum murinum	Wall barley	FACU
Hypericum perforatum subsp. perforatum	Klamathweed	FACU
Hypochaeris glabra	Smooth cat's-ear	UPL
Juncus mexicanus	Mexican rush	FACW

Taxon	Common Name	Wetland Status
Juncus xiphioides	Iris-leaved rush	OBL
Lactuca serriola	Prickly lettuce	FACU
Lamium amplexicaule	Deadnettle	UPL
Lupinus bicolor	Miniature lupine	UPL
Lythrum hyssopifolia	Hyssop loosestrife	OBL
Melilotus sp.	Melilotus	UPL
Nasturtium officinale	Watercress	OBL
Olea europaea	Olive	UPL
Paspalum dilatatum	Dallis grass	FAC
Pinus sabiniana	Gray pine	UPL
Plantago lanceolata	English plantain	FAC
Polypogon monspeliensis	Annual beard grass	FACW
Populus fremontii subsp. fremontii	Fremont cottonwood	FAC
Prunus dulcis	Almond tree	UPL
Pyracantha sp.	Pyracantha	UPL
Pyrus sp.	Pear	UPL
Quercus douglasii	Blue oak	UPL
Quercus lobata	Valley oak	FACU
Quercus wislizeni	Interior live oak	UPL
Rubus armeniacus	Himalayan blackberry	FACU
Rumex crispus	Curly dock	FAC
Salix exigua var. exigua	Narrowleaf willow	FACW
Salix lasiolepis	Arroyo willow	FACW
Silybum marianum	Milk thistle	UPL
Sonchus asper subsp. asper	Prickly sow-thistle	FAC
Spartium junceum	Spanish broom	UPL
Torilis arvensis	Field hedgeparsley	UPL
Toxicodendron diversilobum	Western poison-oak	FACU
Trifolium hirtum	Rose clover	UPL
Verbascum blattaria	Moth mullein	UPL
Verbascum thapsus	Woolly mullein	FACU
Veronica sp.	Speedwell	VARIES
Vicia sativa	Common vetch	FACU
Vicia villosa	Winter vetch	UPL
Vinca major	Periwinkle	UPL

Appendix C.
USACOE Aquatic Resources Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Wetland Swale-1	CALIFORNIA	PEM2	SLOPE	Area	0.125	ACRE	DELINEATE	38.80860477	-121.2046204	Sucker Ravine
Wetland Swale-2	CALIFORNIA	PEM1	SLOPE	Area	0.012	ACRE	DELINEATE	38.80984881	-121.2025173	Sucker Ravine
Wetland Swale-3	CALIFORNIA	PEM2	SLOPE	Area	0.016	ACRE	DELINEATE	38.80752123	-121.2052995	Sucker Ravine

Attachment 1.
USACOE Verification Letter, March 2009

ATTACHMENT 1

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

RECEIVED
MAR 26 2009
BY:----------

REPLY TO ATTENTION OF

March 20, 2009

Regulatory Division (SPK-2008-00630)

Stephen Patterson
Patterson Properties
2270 Douglas Boulevard, Suite 111
Roseville, California 95661

Dear Mr. Patterson:

We are responding to your consultant's request for an approved jurisdictional determination for the Sierra-Brace Property. This approximately 17.88-acre site is located in Section 28, Township 11 North, Range 7 East, MDB&M, Latitude 38.808793° North, Longitude 121.203869° West, near the City of Rocklin and Town of Loomis, Placer County, California.

Based on available information, we concur with the estimate of waters of the United States, as depicted on the February 28, 2008, *Appendix C, Wetland Delineation Map, Sierra-Brace Study Area, Town of Loomis, Placer County, CA,* drawing prepared by North Fork Associates. Approximately 0.14 acre of waters of the United States, including wetlands, is present within the survey area. These waters are regulated under Section 404 of the Clean Water Act, since they are tributary to an unnamed intermittent stream, which is tributary to Secret Ravine, which is tributary to Miner's Ravine, which is tributary to Dry Creek, which is tributary to the Natomas East Main Drainage Canal, which is tributary to the Sacramento River, a navigable water of the United States.

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331.

A Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDS-O, 1455 Market Street, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 60 days from the date of this letter. It is

not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please complete our customer survey at *http://www.spk.usace.army.mil/customer_survey.html*. Your passcode is "conigliaro".

Please refer to identification number SPK-2008-00630 in any correspondence concerning this project. If you have any questions, please contact (b) (6) at our California North Branch, 1325 J Street, Room 1480, Sacramento, California, 95814-2922, email (b) (6) *@usace.army.mil*, or telephone (916) 557-6740. You may also use our website: *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

ORIGINAL SIGNED

(b) (6)
Chief, California North Branch

Enclosure(s)

Copy furnished without enclosure(s)

✓ Pat Britton, North Fork Associates, 110 Maple Street, Auburn, California 95603
William Marshall, Storm Water and Water Quality Certification Unit, California Regional Water Quality Control Board, Central Valley Region, 11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Kent Smith, California Department of Fish and Game, Region 2, 1701 Nimbus Drive, Rancho Cordova, California 95670-4599
U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
Robert Leidy, Environmental Protection Agency, WRT-8, 75 Hawthorne Street, San Francisco, California 94105
Rodney R. McInnis, Acting Regional Administrator, National Marine Fisheries Service, 650 Capital Mall, Suite 8-300, Sacramento, California 95814-4706

ATTACHMENT 5

USACE Wetland Determination Verification Letter, June 14, 2016

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

June 14, 2016

Regulatory Division (SPK-2008-00630)

Manikas Properties
Attn: Mr. John Manikas
1817 Maryal Drive, Suite 100
Sacramento, California 95864

Dear Mr. Manikas:

We are responding to your May 11, 2016, request for a preliminary jurisdictional determination (JD), in accordance with our Regulatory Guidance Letter (RGL) 08-02, for the Sierra-Brace Property site. The approximately 17.88-acre project site is located in Section 16, Township 11 North, Range 7 East, Mount Diablo Meridian, Latitude 38.80879°, Longitude -121.20387°, Loomis, Placer County, California.

Based on available information, **we concur with the amount and location of wetlands and/or other water bodies on the site as depicted on the enclosed April 18, 2016, *Figure 5 Wetland Delineation Sierra Brace* drawing prepared by Salix Consulting, Inc. (enclosure 1)**. The approximately 0.153 acres of wetland swales present within the survey area are potential waters of the United States regulated under Section 404 of the Clean Water Act.

We have enclosed a copy of the *Preliminary Jurisdictional Determination Form* for this site (enclosure 2). Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization for the activity. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal form is enclosed to notify you of your options with this determination (enclosure 3). This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2008-00630 in any correspondence concerning this project. If you have any questions, please contact (b) (6) [redacted] at our California North Branch Office, Regulatory Division, Sacramento District, U.S. Army Corps of Engineers, 1325 J Street Room 1350, Sacramento, California 95814-2922, by email at (b) (6) [redacted] *@usace.army.mil*, or telephone at 916-557-7759. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Sincerely,

(b) (6) [redacted]

Senior Regulatory Project Manager
California North Branch
Regulatory Division

Enclosures

cc: (w/o encls)
Mr. Jeff Glazner, Salix Consulting, Inc., jglazner@salixinc.com

Biological Resource Report Plants

BIOLOGICAL RESOURCES REPORT
COSTCO WHOLESALE PROJECT
TOWN OF LOOMIS, PLACER COUNTY, CALIFORNIA

Prepared for:
Michael Okuma, NCARB
Director of Real Estate Development
COSTCO WHOLESALE
9 Corporate Park, Suite 230
Irvine, CA 92606

Prepared by:
HUFFMAN BROADWAY GROUP, INC.
828 Mission Avenue
San Rafael, CA 94901
Contact: Gary Deghi
(415) 925-2000 * Fax (415) 925-2006

June 2017

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Figure 2. U.S.G.S Map of the Project Site
Figure 3. Aerial Photo of the Project Site
Figure 4. Costco Wholesale Project Conceptual Plan
Figure 5. Preliminary Grading and Drainage Plan
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Figure 10. Impacts to Vegetation Communities Occurring on the Project Site
Figure 11. Impacts to Wetlands and Waters of the U.S. Subject to Corps Jurisdiction

ATTACHMENT 2. Supplemental Biological Information

Table 1. Plant List for Property
Table 2. Animal Species Observed on the Project Site or Expected to Utilize the Project Site
Table 3. Special Status Plants Known to Occur in the Vicinity of the Project Area, Placer County, California
Table 4. Special Status Animal Species that have been Reported in the Vicinity of the Project Area, Placer County, California.

ATTACHMENT 3. Wetland Delineation for the 17.88 Sierra-Brace Study Area, Town of Loomis, Placer County, California, prepared by Salix Consulting, Inc. May 2016.

This report should be cited as: *Draft Biological Resources Report, Costco Wholesale Project, Town of Loomis, Placer County, California.* June 2017. San Rafael, California 37 pp. plus attachments. Prepared for Costco Wholesale.

1.0 INTRODUCTION

On behalf of Costco Wholesale, Huffman-Broadway Group, Inc. (HBG) has prepared a Biological Resources Report for the Costco Wholesale Project in The Town of Loomis, Placer County, California. It is expected that this Biological Resources Report will be incorporated into an environmental document prepared by Placer County to satisfy requirements of the California Environmental Quality Act (CEQA). This report describes biological resources and ecological constraints present on the 17.88-acre Project Site, including the presence of sensitive habitats and an evaluation of the potential for rare, threatened, or endangered species of flora and/or fauna to occur at the site or in the project vicinity. The report also includes a preliminary review of biological impacts associated with implementation of the project and recommended mitigation measures, as needed.

Our analysis included a review of pertinent literature on habitat characteristics of the site, species of plants and animals expected to utilize the site, a review of planning documents referencing ecological aspects of the site, and field site surveys. The Biological Resources Report also incorporates the results of a wetland jurisdictional determination prepared for the site by Salix Consulting Inc., in May of 2016. This report was a detailed delineation of wetlands and waters of the United States at the property, conducted per criteria of the U.S. Army Corps of Engineers, and the results of the wetland delineation are summarized herein. Also considered is an Arborist's Report prepared by Mann Made Resources. The wetland delineation is included as an attachment herein, and the Arborist's Report is available at the City of Loomis under separate cover. The California Natural Diversity Data Base (CNDDB) was consulted to determine if any populations of endangered, threatened, or rare species have occurred historically or currently are known to exist near the project. The study site was surveyed by HBG biologists between February and June of 2017.

2.0 PROJECT DESCRIPTION

2.1 Location of Project Site

The Project Site is in the Town of Loomis in Placer County, California. The site is north of Interstate 80, in the southeastern corner of the intersection between Sierra College Boulevard and Brace Road. The location corresponds to Section 28 of Township 11 North and Range 7 East on the 7.5 minute Rocklin, CA United States Geological Survey (USGS) quadrangle (Figure 1). The latitude and longitude of the approximate center of the site are 38°48'34" North and121°12'16" West. The Assessor Parcel Numbers (APNs) are 045-042-011, 045-042-012,045-042-023, 045-042-034, 045-042-035, 045-042-036, and 045-042-037.The property is located on the Loomis 7.5-minute U.S. Geographic (USGS) topographic quadrangle map.

Refer to Exhibit 1, Figure 1 for the project site location map, Figure 2 for the location of the project on the Loomis USGS 7.5-minute quadrangle map, and Figure 3 for an aerial photograph of the project site.

2.2 Project Description

Costco Wholesale is proposing to construct a Costco facility at the site as shown in the conceptual plan in Figure 4. The Preliminary Grading and Drainage Plan is shown in Figure 5. The facility includes the Costco warehouse and associated parking and other planned infrastructure. The proposed project would cover the entire site.

3.0 EXISTING SETTING

3.1 Site Description

The Project Site is in the Town of Loomis in Placer County, California. The site is north of Interstate 80, in the southeastern corner of the intersection between Sierra College Boulevard and Brace Road. Adjacent land uses include a multi-family residential building along the northern boundary the Homewood Lumber complex to the north, single family residential to the east, commercial and undeveloped land to the south, and an office building and undeveloped land to the west (Figure 3). The study area is bounded by Brace Road to the north and Sierra College Boulevard to the west.

General features of the project site are as follows:

- **Soils and Topography**. One soil unit is mapped in the study area (Figure 6): Andregg coarse sandy loam, 2 to 9 percent slopes. Andregg soils are well drained and have moderately rapid permeability. This soil is neither ponded nor flooded. This soil does not meet hydric criteria. The study area is located at an elevation between approximately 320 and 340 feet. The topography of the study area gently slopes to the west.

- **Hydrology**. The Project Site is in the Dry Creek watershed (Hydrologic Unit Code 1802011101), as shown in the watershed map of Figure 7. A wetland swale and drainage ditch located in the southwest corner of the site drain water westerly and convey water offsite through culverts underneath Sierra College Boulevard. Water continues to drain westerly on the adjacent property and drains into Sucker Ravine which drains into Secret Ravine. Secret Ravine is a tributary of Miners Ravine, which ultimately reaches Dry Creek and then the American River. The constructed drainage in the northeastern corner conveys storm water and urban runoff from the residential development to the east through a storm drain system.

- **Vegetation**. Based on field reconnaissance by HBG conducted in February 2017 and review of the wetland jurisdictional report (Salix 2016), the Project Site is made up of Valley Oak Woodland, Annual Grassland and Valley Freshwater Marsh. Details of vegetation are provided below in Section 3.2.

- **Climate**. Loomis has a temperate Mediterranean climate with dry hot summers and mild winters. Average high temperature typically varies from 54 degrees F in the winter to approximately 92 degrees in the summer. Average rainfall for the area is approximately 25 inches per year, most occurring between November and April.

3.2 Biological Setting

3.2.1 Plant Communities

An HBG biologist conducted field reconnaissance of the Project Site on February 11 and April 22, 2017, and the HBG botanist surveyed the site for special status plants on March 27 and June 23, 2017. All habitats on the Project Site were surveyed on foot and assessed for similarity to sites known to support special status species within the area. Qualitative information on the composition and distribution of plant species on the sites was obtained during the site visits. Plant communities were identified on aerial photographs of the site.

Vegetation communities are assemblages of plant species growing in an area of similar biological and environmental factors. Vegetation communities and habitats at the project site were identified based on the currently accepted List of Vegetation Alliances and Associations (or Natural Communities List) (CDFW 2010). The list is based on A Manual of California Vegetation, Second Edition (Sawyer and Keeler-Wolf 2009), which is the National Vegetation Classification applied to California. The project site contains three habitat types per this classification: Valley Oak Woodland (7.96 acres), Annual Grassland (10.16 acres), and Valley Freshwater Marsh (0.15 acres). Figure 8 shows the extent and distribution of vegetation types on the property. A list of plant species identified on the property during surveys is included in Attachment 2, Table 1. The main source for the plant list in Table 1 was the wetland delineation report prepared by Salix (2016), which was augmented with additional species noted during surveys by HBG.

Wetland habitats on-site were further classified using the U.S. Fish and Wildlife's Service's "Classification System for Wetland and Deepwater Habitats" (Cowardin et al. 1979); the wetlands at the property are defined as palustrine emergent seasonal wetlands, palustrine emergent vernal pools, and palustrine scrub-shrub wetlands per the Cowardin et al criteria.

Annual Grassland

Annual grassland is the predominant habitat type on site, comprising 10.16 acres, or approximately 56% of the land area. The Annual Grassland found on the property is comprised largely of non-native grasses and forage species. Grasses included Italian ryegrass *(Festuca perennis)*, ripgut grass (*Bromus diandrus)*, soft chess (*Bromus hordeaceus)*, wild oat (*Avena fatua)*, hedgehog dogtail (*Cynosurus echinatus*,) foxtail barley (*Hordeum jubatum)*, and medusahead (*Elymus caput-medusae)*. Forbs present include Italian thistle (*Carduus pycnocephalus*), California mugwort (*Artemisia douglasiana)*, field hedge parsley (*Torilis arvensis)*, klamathweed (*Hypericum perforatum)*, broad-leaf filaree (*Erodium botrys*,) common vetch (*Vicia sativa)*, and cut-leaf geranium (*Geranium dissectum)*, yellow starthistle (*Centaurea solstitialis)*, rose clover (*Trifolium hirtum)*, smooth's cat-ear (*Hypochaeris glabra)*, common fiddleneck (*Amsinckia menziesii)*, short-podded mustard (*Hirschfeldia incana)*, and bindweed (*Convolvulus arvensis*). The annual grassland onsite appears to be disked annually.

Valley Oak Woodland

Valley Oak Woodland comprises 7.96 acres or approximately 44% of the site. The foothill

woodland varies in density throughout the site, being mostly open, and it is dominated by valley oak (*Quercus lobata)* and interior live oak (*Quercus wislizeni)*, with a small number of blue oak (*Quercus douglasii)*, and a few scattered foothill pines (*Pinus sabiniana)*. Shrubs in the understory include thickets of coyote brush (*Baccharis pilularis)* and Himalayan berry (*Rubus armeniacus)*. Groundcover is mostly the non-native herbaceous plants and grasses that are noted as occurring in the Annual Grassland above.

A tree survey conducted on the site by Mann Made Resources (Mann Made Resources 2016) found 372 trees that were determined to be of protected size. The Tree Preservation Ordinance of the Town of Loomis provided the requirements for data collection; blue oaks 4 inches in diameter and greater and valley and interior live oaks 6 inches in diameter and greater are considered Protected Trees. The 372 trees of protected size consisted of 284 valley oaks, 86 Interior live oaks, and two blue oaks. Of these, 162 trees were found to be in good or fair condition and 210 trees were found to be in poor, very poor, or dead condition. The 210 trees included 170 trees in poor condition, 36 trees in very poor condition, and four trees that were dead. Detailed information regarding all trees on the property is included in the Tree Report (Mann Made Resources 2016), including information on species, size, condition, suitability for preservation.

The California Oak Woodlands Conservation Program recognizes oak woodlands as a vital statewide resource providing benefits including wildlife habitat, monetary and ecological value, and an ability to reduce soil erosion, enhance water quality and moderate temperatures.

Valley Freshwater Marsh

Valley Freshwater Marsh habitat occurs within three separate swales occurring on the property. The marsh habitats total 0.15 acres. The three separate wetland swales are shown in Figure 8 and are described in detail in Section 3.2.3 (Wetland and Other Waters of the U.S. Delineation).

One of three swales flows westerly through the oak woodland into a culvert under Sierra College Boulevard. The eastern end of the swale is a small open area dominated by iris leaf rush (*Juncus xiphioides)*. The swale flows through a patch of coyote brush, and the lower portion of the swale includes wetland plant species such as hyssop loosestrife (*Lythrum hyssopifolia)*, curly dock (*Rumex crispus)*, prickly lettuce (*Lactuca serriola*,) Italian ryegrass, and Mexican rush *(Juncus mexicanus)*. A short swale in the northeast corner of the site is vegetated with Himalayan blackberry and flows under Starlight Lane. The third swale in the southwestern corner of the study area is an area where stormwater runoff drains onto the Project Site from nearby commercial development and travels about 175 feet before exiting the site through a culvert under Sierra College Boulevard. Wetland species such as water plantain (*Alisma triviale)*, speedwell (*Veronica* sp.), moth mullein (*Verbascum blattaria)*, water cress (*Nasturtium officinale)*, and curly dock are present.

3.2.2 Animal Populations

The species discussed in this study are based on review of available literature, visits to the area by HBG wildlife biologist for many years, and habitat observations made during qualitative

surveys conducted by HBG wildlife biologist Gary Deghi on February 11 and April 22, 2017. A complete listing of the references from which information was compiled on the flora and fauna inhabiting the region is contained in the References section. Table 1 (Attachment 2) provides species lists based on these reconnaissance level observations for reptiles, amphibians, birds and mammals. The table lists all wildlife species observed or expected on the project sites and in the site vicinity and includes the scientific names of all species mentioned in the text.

The wetland habitats and the disturbed annual grassland and oak woodland habitats onsite support a variety of wildlife species. The complex of habitats includes the presence of small streams that can accommodate wildlife adapted to aquatic areas, and upland vegetation that provides potential foraging areas for species of mammals, reptiles, amphibians and birds. Native trees and shrubs are present along with native and non-native herbaceous plants and grasses that provide a mix of habitats suitable to support nesting by a variety of both passerine and non-passerine avian species.

Much of the wildlife observed at the site during the February 11 field reconnaissance included resident and wintering species of birds that are adapted to the mix of wetland and upland habitats found at the site. Resident bird species observed during the field review included red-shouldered hawk, Anna's hummingbird, mourning dove, Northern flicker, acorn woodpecker, Nuttall's woodpecker, black phoebe, western bluebird, California scrub-jay, European starling, Northern mockingbird, oak titmouse, bushtit, white-breasted nuthatch, Bewick's wren, California towhee, white-crowned sparrow, song sparrow, purple finch and house finch. Species observed that are expected only during the winter include red-breasted sapsucker, American robin, hermit thrush, ruby-crowned kinglet, yellow-rumped warbler, and golden crowned sparrow. Despite looking under logs and boards, no reptiles were observed and the only amphibian recorded was Pacific treefrog. No mammals were documented at the site.

The April 22 site visit was timed to provide information about patterns of wildlife use during the spring nesting season of many avian species. Many of the resident species noted during the February 17 reconnaissance were observed including red-shouldered hawk, Anna's hummingbird, mourning dove, acorn woodpecker, Nuttall's woodpecker, black phoebe, California scrub-jay, European starling, Northern mockingbird, oak titmouse, bushtit, white-breasted nuthatch, Bewick's wren, California towhee, white-crowned sparrow, and house finch. Other resident species noted during the April survey included band-tailed pigeon, common raven, orange-crowned warbler, lark sparrow, savannah sparrow, American goldfinch, lesser goldfinch and Brewer's blackbird. Cedar waxwing and golden-crowned sparrow were observed, and these species would be considered migrants passing through as the project site is not within the nesting range of these species. Neotropical migrants that breed in the area were also observed including Western kingbird and Bullock's oriole. Any of the resident species or breeding neotropical migrants could nest on the Project Site, and evidence of nesting (observation of birds either on a nest or carrying nesting material) was observed during the field review for Northern mockingbird, bushtit, oak titmouse, Western kingbird and Bullock's oriole. A pair of red-shouldered hawks were on territory on the western portion of the site and likely have a nest either on the project site or the immediate vicinity. Other raptors observed

flying over the site included red-tailed hawk, Swainson's hawk and turkey vulture.

Amphibians noted at the site during the spring survey included Pacific treefrog (tadpoles in the wetlands) and reptiles included Western fence lizard and Southern alligator lizard. Additional amphibians likely include western toad, and common reptiles likely include western skink, ringneck snake, gopher snake and common garter snake. Although no mammals were documented at the site, it is expected that mammals adapted to urban environments would be found on the property including Botta's pocket gopher, striped skunk, raccoon, Virginia opossum, deer mouse and mule deer.

3.2.3 Wetland and Other Waters of the U.S. Delineation

Definitions of Wetlands and Other Waters of the U.S.

The Department of the Army, acting through the U.S. Army Corps of Engineers (Corps), has the authority to permit the discharge of dredge or fill material in waters of the U.S. under Section 404 of the Clean Water Act (CWA), and permit work and placement of structures in navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899 (RHA).

EPA and the Corps define wetlands as: "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (EPA regulations at 40 CFR § 230.3(t); Corps regulations at 33 CFR § 328.3(b)). The term "*under normal circumstances*" refers to situations in which the vegetation has not been substantially altered by man's activities as defined in Appendix A of the Corps' 1987 *Wetlands Delineation Manual*. Clarification of the term, as it pertains to farmed wetlands, was furthered defined in Regulatory Guidance Letter 90-7 dated September 26, 1990, as "the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed."

Under Section 10 of the Rivers and Harbors Act of 1899, the Corps also regulates the construction of structures in, over, or under; excavation of material from; or deposition of material into navigable waters. As described by Corps' regulation 33 CFR § 329.4, the general definition of "navigable waters" includes those waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or might be susceptible for use to transport interstate or foreign commerce. Several factors must be examined when making a determination whether a waterbody is a navigable water. These factors include (a) past, present, or potential presence of interstate or foreign commerce; (b) physical capabilities for use by commerce and (c) defined geographic limits of the waterbody. A determination of navigability, once made by the Corps, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impeded or destroy navigable capacity. Based on this provision, the Corps also has the discretion to regulate activities in historically navigable waters. Historically navigable waters are areas that were navigable in the past, but are no longer navigable because of artificial modifications, such as levees, dikes, and dams.

Furthermore, waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 C.F.R. §328.3(e)).

Detailed Wetland and Other Waters of the U.S. Delineation-Methodology

Salix Consulting, Inc. conducted a preliminary wetland delineation of the property in May of 2016 (Salix Consulting 2016, see Attachment 3) in accordance with Code of Federal Regulations (CFR) definitions of jurisdictional waters, the Corps' 1987 *Wetlands Delineation Manual* (1987 Manual), the Corps' 2008 *Regional Supplement to Corps of Engineers Wetland Delineation Manual: Arid Wes, Version 2.0* (Arid West Regional Supplement) and supporting guidance documents. The 1987 Manual provides technical guidance and procedures, from a national perspective, for identifying and delineation of wetlands that may be subject to Section 404 of the CWA. Pursuant to the 1987 Manual, key criteria for determining the presence of wetlands are: (a) the presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by groundwater or surface water; and (b) a prevalence of vegetation typically adapted for life in saturated soil conditions (i.e., hydrophytic vegetation). Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. The Arid West Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. The combined use of the 1987 Manual and Arid West Regional Supplement enhances the technical accuracy, consistency, and credibility of wetland determinations.

Detailed Wetland Delineation-Results

A total of 0.15 acres of vegetated palustrine emergent wetlands were found within the project site as shown in Figure 9. This finding is based on the collective presence of hydric soil, wetland hydrology, and wetland vegetation indicators. The identified palustrine emergent wetlands contained low chroma soils, evidence of wetland hydrology and vegetation adapted for life in saturated soil conditions. The 0.15 acres of vegetated wetlands on the project site are palustrine emergent seasonal wetlands and palustrine scrub-shrub wetlands per Cowardin et al. (1979) criteria. The wetlands mapped on site consist of areas located within the three drainages found on the property. The 0.15 acres of jurisdictional waters of the US serve the functions of flood flow alteration, groundwater recharge, sediment reconstruction, sediment/toxicant retention, nutrient removal/ transformation, production export, and wildlife habitat.

Aquatic resources within the Study Area and adjacent to the Study Area were examined with respect to the *Solid Waste Agency of Northern Cook County* (*SWANCC) v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) exclusion from Clean Water Act regulation. No areas were found that could either potentially be exempted or excluded from regulation in accordance with SWANNC. HBG has also reviewed the wetlands with respect to the *Rapanos v. United States* and *Carabell v. United States* 547 U.S. 715 (2006) and found the areas in question to be jurisdictional pursuant to the Corps criteria.

The wetland map was verified by the Sacramento District of the Corps of Engineers on June 14, 2016 (see wetland determination letter from the Corps in Attachment 3). Three areas of jurisdictional wetland have been verified on the property. These are noted in Figure 8 as Wetland Swale (WS)-1, WS-2 and WS-3 and are described below with information contained the wetland delineation report (Salix Consulting 2016).

- WS-1 (0.12 acres) occurs within the foothill woodland habitat. The swale begins in the middle of the study area, where it collects surface water (in the form of sheet flow) and then drains westerly, where it then exits the study area through a culvert underneath Sierra College Boulevard. The swale then continues west to culvert adjacent to Sierra College Boulevard.

- WS-2 (0.01 acres) enters the study area through a culvert along the eastern boundary in the northeast corner of the study area. The swale appears to convey stormwater runoff and urban water westerly for approximately 80 feet within the study area, and then exits the study area through a culvert underneath Starlight Lane.

- WS-3 (0.02 acres) occurs in the southwestern corner of the study area, where stormwater runoff drains onto the study area through an 18-inch PVC culvert located on the commercial development (McDonald's/Chevron) to the south. The swale continues for approximately 175 feet west until it merges with a narrower excavated ditch that drains water from a 12-inch concrete culvert located under the commercial development to the south. Water exits the study area along the western boundary through a 30-inch corrugated metal pipe culvert under Sierra College Boulevard.

3.2.4 Special Status Species

Sensitive species include those species listed by the federal and state governments as endangered, threatened, or rare or candidate species for these lists. Endangered or threatened species are protected by the federal Endangered Species Act of 1973 as amended, the California Native Plant Protection Act of 1977, and the California Endangered Species Act of 1970. The California Environmental Quality Act (CEQA) provides additional protection for unlisted species that meet the "rare" or "endangered" criteria defined in Title 14, California Code of Regulations, Section 15380.

The CDFW maintains records for the distribution and known occurrences of sensitive species and habitats in the California Natural Diversity Database (CNDDB). The CNDDB is organized into map areas based on 7.5 minute topographic maps produced by the U.S. Geological Survey (USGS). All known occurrences of sensitive species and important natural communities are mapped onto the quadrangle map. The database gives further detailed information on each occurrence, including specific location of the individual, population, or habitat (if possible) and the presumed current state of the population or habitat. The Project Site is in the Rocklin 7.5-minute USGS topographic quadrangle map. The relevant adjacent quads within the search area are the Roseville, Lincoln, Gold Hill, Auburn, Pilot Hill, Folsom, and Citrus Heights quadrangles.

HBG collected all information contained within the CNDDB regarding special status species within a 10-mile radius of the Project Site.

A search of the CNDDB records of occurrence for special status animals and plants and natural communities within these quadrangles indicated that none have been documented as occurring on the Project Site itself, but that a number of special status animal species have been known to occur in the project vicinity. The absence of a special animal, plant, or natural community from the report does not necessarily mean they are absent from the area in question, but only that no occurrence data have been entered for that species or natural community in the CNDDB inventory. The occurrence of special status plant and animal species near the project area may be an indication that they also could occur at the Project Site, depending on habitat conditions at the site. Therefore, occurrences of special status species throughout the quadrangles mentioned above were noted in considering the potential presence of these species on the Project Site.

An evaluation of all special status plant species reported near the Project Site is presented in Table 3 (Attachment 2). Table 4 presents an evaluation of special status animal species that have been reported near the project.

Special Status Plant Species

Special status plant species include: (i) species that are listed or proposed for listing as threatened or endangered under the federal Endangered Species Act; (ii) species that are listed, or proposed for listing by the state of California as threatened or endangered under the California Endangered Species Act; (iii) plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered in California and elsewhere; and (iv) plant species that meet the definition of rare or endangered under CEQA.

A target list of special status plants found within 10 miles of the site is shown in Table 3 that includes all species mentioned in the CNDDB occurring within 10 miles of the project site. Many of the species mentioned in the CNDDB as occurring within 10 miles of the project require habitats that are not found on the Project (e.g., vernal pools, chaparral, coniferous forest) or microhabitat conditions such as soils that do not occur on the property (gabbro or serpentine). Based on field review of the habitats and conditions occurring on the site, HBG determined that Project Site habitats are potentially suitable to support several species of special status plant. These species are listed below along with their flowering periods (Munz and Keck 1973).

- Big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis*) a CNPS List 1B.2 plant, that is sometimes, but not always found in serpentine. Flowering period from March to June.
- Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*), a CNPS List 4.2 plant. Flowering period from May to July.
- Stinkbells (*Fritillaria agrestis*), a CNPS List 4.2 plant, that is sometimes, but not always found in serpentine. Flowering period from March to June.

Protocol surveys of the site for special status plant species were conducted by HBG botanist, Dr. Terry Huffman during the spring and summer of 2017. The systematic surveys were conducted both early and late in the flowering period of target species (field surveys were conducted on March 27 and June 23, 2017). Special status plant surveys were conducted pursuant to *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009) that require systematic search techniques in all habitats of the site to ensure thorough coverage of potential impact areas. All vascular plant species were identified using keys and descriptions in the Jepson Manual (Baldwin et al 2012). Specimens of target species were reviewed in the Jepson Herbarium prior to trips to the field.

None of the target species or any other special status plant species were found on the site during the spring/summer 2017 protocol surveys of the property.

Special Status Animal Species

The special status animal species evaluated in Table 4 (Attachment 2) include those noted in the CNDDB as occurring within 10 miles of the site and those that are known to occur in the general vicinity based on the knowledge of HBG biologists. Key species are either known to occur in the vicinity of the property or with a potential to occur at the site, or that require specific study to determine presence/absence, are discussed below.

HBG has consulted the CDFW California Natural Diversity Data Base (CNDDB) to ascertain the potential for special status animal species occurring within the 7.5-minute quadrangle map areas in the project site vicinity. The CNDDB indicates that seven special status species deserve note as having occurred within the 10-mile radius of the site: vernal pool fairy shrimp (*Branchinecta lynchi*), California linderiella (*Linderiella occidentalis*), Steelhead-Central Valley DPS *(Oncorhynchus mykiss irideus),* Western spadefoot toad (*Spea hammondii*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*) and tricolored blackbird *(Agelaius tricolor).* These species are discussed below. Other species found to occur within the general CNDDB search area, or determined to be potentially present based on the knowledge of the investigators, are evaluated in Table 4.

HBG wildlife biologist Gary Deghi conducted a variety of special status species surveys and habitat assessments on the project site during a field visit conducted on February 11 and April 22, 2017. The field work included an evaluation of wetlands swales areas for suitability to support the vernal pool fairy shrimp, vernal pool tadpole shrimp and western spadefoot toad. Gary Deghi of HBG also conducted habitat evaluations related to other special status species including possible use of the site by special status raptors (including Swainson's hawk, burrowing owl, white-tailed kite and others) and other special status species such as Western pond turtle, tricolored blackbird and loggerhead shrike.

Listed Vernal Pool Large Branchiopods

The two most common of the large branchiopods occurring in the Central Valley, that are listed under the federal Endangered Species Act, are the threatened vernal pool fairy shrimp (VPFS, *Branchinecta lynchi*) and endangered vernal pool tadpole shrimp (VPTS, *Lepidurus packardi*).

These large branchiopods are ephemeral creatures. When the temporary water bodies that they inhabit dry up, the population remains in the dry basin as cysts (embryonic eggs). These cysts can withstand harsh conditions (i.e., freezing and desiccation) while they await the return of rain to fill their pools. After the appropriate environmental conditions (i.e., water temperature, pH, oxygen concentration, etc.) prevail, the young hatch, quickly mature, and then mate to ensure the next generation.

Potential habitat for listed large branchiopods is considered any seasonally-inundated depression that on average ponds water at a sufficient depth and duration for a listed branchiopod to complete its lifecycle. Potential habitat for the VPFS and VPTS are defined as any seasonal inundated depression that on average ponds water 2.0 inches or greater in depth for 14 or more consecutive days and 30 or more consecutive days, respectively.
Generally, these habitats occur within the California Floristic Province at elevations below 5,600 feet in Coast Range and below 3,000 feet elevations for the rest of the State and Oregon. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages) or semi-to-permanently inundated areas that support perennial population of predators (e.g. bullfrogs, fish, and crayfish) are generally not considered suitable habitat for federally listed large branchiopods.

The records search of the CNDDB (CDFW 2017) revealed occurrences of the VPFS or VPTS within vernal pool landscapes as close at about 3 miles to the south and west of the Project Site. The seasonal swales at the Project Site do not have inundation characteristics that would support listed large branchiopods as these areas are flowing water systems that were inundated at depths of up to 6 to 8 inches even in late-April. It was determined that the seasonal swales at the Project Site do not exhibit the characteristics that would accommodate use of the site by either of these listed species of vernal pool crustacean.

California Linderiella

The California linderiella (*Linderiella occidentalis*), also known as the California fairy shrimp, is not listed by the federal ESA or CESA, but was at one time a federal species of concern and is listed by the International Union for the Conservation of Nature (IUCN) as a species threatened with extinction. It is generally found in the same types of aquatic habitats as vernal pool fairy shrimp and frequently co-occurs with this species. This species tends to live in large, fairly clear vernal pools and lakes. However, they can survive in clear to turbid water with a pH from 6.1 to 8.5, and they have also been found in very small pools. They are tolerant of water temperatures from 41 degrees to 85 degrees F, making them the most heat tolerant fairy shrimp in California. The California fairy shrimp is the most common fairy shrimp in the Central Valley. It has been documented in most land forms, geologic formations and soil types supporting vernal pools in California, at altitudes as high as 3800 feet above sea level. The range extends from Shasta County south to Fresno County and across the valley to the coast and Transverse Ranges from Willits in Mendocino County south to near Sulfur Mountain in Ventura County.

The CNDDB documents that California linderiella have occurred in vernal pool landscapes as near as two miles south of the Project Site. None of the seasonal wetlands found on the Project

Site have inundation characteristics making them suitable to support California linderiella.

Steelhead- Central Valley DPS

Central Valley steelhead was originally listed in 1998 as a threatened species and the listing was reconfirmed in January of 2005. The Central Valley Distinct Population Segment (DPS) includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco Bay and San Pablo Bays and their tributaries. Central Valley steelhead spawn and rear, or have the potential to spawn and rear, in western Placer County streams, including Coon Creek, Doty Ravine, Auburn Ravine, Secret Ravine, and Miners Ravine. In the project area, Central Valley steelhead are found in Dry Creek and its tributaries in Secret Ravine and Miners Ravine, located about four miles southwest of the Project Site.

Steelhead are anadromous, but some individuals may complete their life cycle within a given river reach. Historical records indicate that adult steelhead enter the mainstem of the Sacramento River in July, peak in abundance in September and October, and continue migrating through February or March. Most steelhead spawn from December through April, with the most spawning occurring from January through March. Unlike Pacific salmon, some steelhead may survive to spawn more than once, returning to the ocean between spawning migrations. Juvenile migration to the ocean generally occurs from December through August. Most Sacramento River steelhead migrate in spring and early summer. After 2 to 3 years of ocean residence, adult steelhead return to their natal stream to spawn as 3- or 4-year-olds.

Local populations of Central Valley steelhead are found in Dry Creek and its tributaries, most notably in Secret Ravine and Miners Ravine. The CNDDB (CDFW 2017) reports that the mainstem of Dry Creek is used by the fish as a migratory corridor as the water quality and substrate are too degraded so support spawning. Spawning and rearing habitat is found in tributaries upstream from Dry Creek, including both Secret Ravine and Miners Ravine, which are located about four miles southwest of the Project Site. Electrofishing surveys conducted in 2004 caught 136 steelhead in Secret Ravine and evidence of spawning was also reported in 2007. Cottonwood Dam was a barrier to fish passage in Miners Ravine until the dam's collapse in 2009.

Western Spadefoot Toad

The western spadefoot toad (*Scaphiopus hammondi*i) is a state-designated species of special concern that is known from the Central Valley and adjacent foothills, and from the interior coast ranges south of San Francisco Bay to Baja California. Western spadefoot toads require presence of an aquatic habitat for breeding and a terrestrial habitat for feeding and aestivation. Western spadefoot toads are mostly terrestrial, using upland habitats to feed and burrow in for their long dry-season dormancy. The species primarily occurs in grasslands habitat, typically near extensive areas of friable soils (but usually not sandy), but can occur in valley-foothill woodlands, coastal scrub and chaparral communities below 3,000 ft. elevation.

The western spadefoot toad requires seasonally-inundated wetlands for reproduction and

metamorphosis, but have been known to utilize slow-mowing waters and pools within washes, river floodplains, alluvial fans, alkali lakes and playas. They mate during the rainy season (generally from January to March), usually after heavy rains. Potential western spadefoot toad breeding habitat includes any seasonally to semi-permanently inundated depression that on average ponds water at a sufficient depth and duration for a toad to complete its lifecycle (eggs to metamorphosis) which occurs in the known range of the species. Habitats that swiftly flow water (e.g., creeks, streams, and ephemeral drainages) or support populations of predators (e.g. bullfrogs, fish, crayfish) are generally not considered suitable habitat for western spadefoot toad larvae.

The CNDDB reports occurrences of western spadefoot toad in suitable habitat approximately 3.5 miles southwest of the Project Site. The Project Site is within the range of western spadefoot toad, and a review of habitat conditions during field studies conducted on February 11 and April 22, 2017 found seasonal swales within woodland situations (riparian situations or oak woodland) that are potentially suitable but not optimal habitat conditions for the species. Water depths of up to 6 to 8 inches were present in wetland WS-1 within the foothill woodland during field inspection conducted in late-April, and Pacific treefrog tadpoles were observed in this wetland during the field survey. No tadpoles for western spadefoot toad were observed. Even though wetland WS-1 is not an optimal situation in which to find western spadefoot toad and no larvae were observed during the April 22, 2017 survey, there is a remote chance that western spadefoot toad could occur at the site.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is a medium-sized hawk that is state-listed in California as threatened species and designated by the USFWS as a Bird Species of Conservation Concern. Most Swainson's hawk territories in the Central Valley are in riparian systems adjacent to suitable foraging habitats. Valley oak, Fremont cottonwood, walnut and large willows with an average height of about 58 feet, and ranging from 41 to 82 feet, are the most commonly used nest trees in the Central Valley (CDFG 2007), but eucalyptus is also commonly used. Swainson's hawks often nest peripherally to riparian systems of the valley as well as utilizing lone trees or groves of trees in agricultural fields. Suitable foraging areas include grasslands, pastures, alfalfa and other hay crops, and certain grain and row croplands. In the Central Valley, Swainson's hawks find suitable foraging habitat in such agricultural areas near suitable nest sites, however, nesting habitat is in decline due primarily to flood control projects, agricultural practices, and urban development. The current population of Swainson's hawk in California's Central Valley is estimated at 1,948 breeding pairs (CDFW 2007), with most of this population occurring in the area from Stanislaus County north to Butte County.

The nearest documentation of nesting Swainson's hawk is about 7 miles west of the Project Site, according to the CNDDB. Swainson's hawk is much more likely to nest in trees near riparian habitats or agricultural fields on the Valley floor rather than in oak woodland in the foothills, such as found at the Project Site. Use of the Project Site by this species is probably limited to occasional visits while foraging, as evidenced by the observation of a single Swainson's hawk flying over the site during the April 22, 2017 site survey. No evidence of

nesting by Swainson's was observed at the Project Site or anywhere in the immediate vicinity during the nesting season survey in late April.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is a state species of special concern and designated by the USFWS as a Bird Species of Conservation Concern. Burrowing owls are small terrestrial owls commonly found in open grassland topography ranging from western Canada to portions of South America. Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. In California, burrowing owls most commonly use ground squirrel burrows, but they also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement. Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers during migration. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance.

The nearest report of burrowing owl in the CNDDB is more than eight miles west of the site. A survey of the project area was conducted by HBG wildlife biologist Gary Deghi during the February 11, 2017 site visit and again during a survey of the site on April 22, 2017, and no burrowing owls were observed. The site is also lacking in colonies of California ground squirrels that are the most common burrow occupied by burrowing owl. In addition, habitat at the Project Site was found to be unsuitable to support burrowing owl, as heights of herbaceous plants and grasses throughout the on-site uplands were too high to support foraging by this species. Based on these findings, it is very unlikely that burrowing owl occurs on the Project Site. In addition, no California ground squirrels or their burrows were observed anywhere on the site during field review, indicating that presence of burrowing owl on the property is extremely unlikely.

Tricolored Blackbird

Tricolored blackbird (*Agelaius tricolor*) is a Candidate for listing as Endangered under CESA and is also designated by the USFWS as a Bird Species of Conservation Concern. Commencing on December 29, 2014, tricolored blackbird nesting colonies were given a six-month emergency listing as an endangered species under the California Endangered Species Act. Tricolored blackbird is a highly colonial nesting species that breeds near freshwater, preferably in emergent wetlands with tall, dense growth of cattails or tules. Even when the preferred nesting substrates are available, other vegetation may be used for nesting including sedges, nettles, willows, thistles, mustard, blackberry, wild rose, foxtail grass or barley. Since the 1970s with declines in populations, nesting in cereal crops and dairy silage has been documented. Tricolored blackbird foraging areas include rangeland, fields of alfalfa or cut hay, or irrigated pastures with an abundance of insects. No areas of the Project Site provide suitable habitat for a nesting colony of tricolored blackbird, nor do onsite habitats provide foraging habitat for the species.

Special Status Raptor Species- Six raptor species designated with special status by the State of California have a small potential to nest at the site. These species include ground-nesting species: burrowing owl (State Species of Special Concern and Federal Bird Species of Conservation Concern), and Northern harrier (State Species of Special Concern and Federal Bird Species of Conservation Concern); and tree nesting species: white-tailed kite (California Fully Protected), Cooper's hawk (California Watch List Species), Sharp-shinned hawk (California Watch List Species) and Swainson's hawk (state-listed threatened).

Three raptor species that could occur are designated as state species of special concern based on presence of wintering habitat (ferruginous hawk, golden eagle, and merlin). These species are wide-ranging species often wintering over a broad area, and incidental use of the site by any these species in winter is certainly possible. The site, however, contains no unique habitat features that would highlight the importance of the site as a wintering location for any of these species.

3.2.5 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act conserves and manages the fishery resources found off the coasts of the United States, the anadromous species, and the Continental Shelf fishery resources of the United States, including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The National Marine Fisheries Service (NMFS) enforces the Magnuson-Stevens Fishery Conservation and Management Act and regulates commercial and recreational fishing and the management of fisheries resources. Consultation with NOAA Fisheries is required for all projects with the potential to affect EFH for any MSA species. Central Valley fall/late fall–run Chinook salmon is a Magnuson-Stevens Fishery Conservation and Management Act managed species.

In the Central Valley, fall/late fall–run Chinook historically spawned in all major streams draining the Sierra Nevada, but fish passage has since been blocked by dams. Currently, fall/late fall–run Chinook salmon compose about 80% of the total Chinook salmon produced in the Sacramento and San Joaquin drainages. Fall/late fall–run Chinook salmon spawn in the Sacramento and San Joaquin Rivers and most of their tributaries. Central Valley fall/late fall–run Chinook salmon spawn and rear, or have the potential to spawn and rear, in western Placer County streams including Bear River, Coon Creek, Doty Ravine, Auburn Ravine, Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Jones and Stokes 2005). Antelope Creek, Secret Ravine and Miners Ravine may be considered as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of Central Valley fall/late fall–run Chinook salmon.

4.0 REGULATORY AGENCIES AND POLICIES

The following is a description of federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

FEDERAL

Clean Water Act-Section 404

The U.S. Army Corps of Engineers regulates discharges of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into Waters of the U.S., including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. §328.2(f)). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency are responsible for implementing the Section 404 program. Section 404(a) authorizes the Corps to issue permits, after notice and opportunity for comment, for discharges of dredged or fill material into waters of United States. Section 404(b) requires that the Corps issue permits in compliance with EPA guidelines, which are known as the Section 404(b)(1) Guidelines. Specifically, the Section 404(b) (1) guidelines require that the Corps only authorize the "least environmentally damaging practicable alternative" (LEDPA) and include all practicable measures to avoid and minimize impacts to the aquatic ecosystem. The guidelines also prohibit discharges that would cause significant degradation of the aquatic environment or violate state water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 C.F.R. §328.3(b)).

Furthermore, Jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 C.F.R. §328.3(e)).

Tidal waters are also under the jurisdiction of the Corps. The landward limits of jurisdiction in tidal waters extend to the high tide line…"or, when adjacent non-tidal waters of the United States are present, to the limits of jurisdiction for such non-tidal waters" (33 C.F.R.§328.4(b)) High tide is further defined to include the line reached by spring high tides and other high tides that occur with periodic frequency (33 C.F.R.§328.3(d)).

All wetlands at the Project Site were reviewed to determine if they could be disclaimed from Corps jurisdiction as isolated wetlands following two recent US Supreme Court decisions. In *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (SWANCC), No. 99-1178 (2001),* some isolated wetlands may be excluded from the Corps' Section 404 jurisdiction because they are (1) non-tidal, (2) non-navigable, (3) not hydrologically connected to navigable waters or adjacent to such waters, and (4) not subject to foreign or interstate commerce.

Subsequent to SWANCC, the U.S. Supreme Court decided on *Rapanos v. United States* and *Carabell v. United States*, 126 U.S. 2208 (2006) (herein referred to as Rapanos). In 2007, guidance was given to EPA regions and Corps districts to implement the Supreme Court's decision which addresses the jurisdiction over waters of the U.S. under the Clean Water Act. The Rapanos guidance requires the Corps to conduct detailed analysis of the functions and values of wetlands and other waters of the U.S. potentially onsite and in some cases offsite, determine if there is a nexus to traditional navigable waters and the significance of the nexus to the traditional navigable water. Neither the Court nor the recently-issued guidance draw a clear line regarding the geographic reach of jurisdiction, particularly in drainages where flows are ephemeral and where wetlands are adjacent to but not directly abutting relatively permanent water, such as the wetlands delineated on the study site.

The guidance includes requirements for additional documentation, particularly regarding whether there is a "significant nexus" to a traditionally-navigable water (TNW). For water bodies that are traditionally navigable (and their adjacent wetlands), and for tributaries that are "relatively permanent waters" (RPW's: streams that are not perennial but that flow for 3 months or more annually, and their adjacent wetlands that directly abut the RPW's), the Corps and EPA will assert jurisdiction under the Clean Water Act, without the need for any exhaustive documentation of "significant nexus." There is no dispute that Clean Water Act jurisdiction encompasses traditionally-navigable waters and their perennial and relatively-permanent tributaries. Activities that result in discharges of pollutants into these waters can adversely affect the physical, chemical, and biological integrity of navigable waters.

For wetlands adjacent to but not directly abutting a RPW, jurisdiction may be asserted under the Clean Water Act if there is a "significant nexus" and for tributaries that typically do not flow more 3 months or more annually, and if there are adjacent wetlands associated with these non-relatively permanent waters (non-RPW's), jurisdiction may be asserted under the Clean Water Act if there is a "significant nexus." A significant nexus analysis, using the Corps' approved jurisdictional determination form, "will assess the flow characteristics and functions of the

tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW." These factors include (a) the capacity to carry pollutants or flood water into a TNW; (b) the capacity to provide habitat for species that are present in the downstream TNW; (c) the capacity of transferring nutrients and organic carbon to a TNW; or (d) other "relationships to the physical, chemical, or biological integrity of the TNW.

Clean Water Act-NPDES Requirements

In 1972, the Clean Water Act was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollution Discharge Elimination System (NPDES) permit. The 1987 amendments established a framework for regulating municipal, industrial, and construction-related storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that establish storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water from construction projects that encompass one or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. The California State Water Resource Control Board has developed a general construction storm water permit to implement this requirement.

Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend. The FESA establishes an official listing process for plants and animals considered to be in danger of extinction; requires development of specific plans of action for the recovery of listed species; and restricts activities perceived to harm or kill listed species or affect critical habitat (16 USC 1532, 1536).

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3) Taking can result in civil or criminal penalties. Federal regulation 50 CFR 17.3 further defines the term harm in the take definition to mean any act that kills or injures a federally listed species, including significant habitat modification or degradation. Additionally, FESA prohibits the destruction or adverse modification of designated critical habitat. In the Service's regulations at 50 CFR 402.2, destruction or adverse modification is defined as a "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species.

The ESA also requires federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat (16 USC 1536). Therefore, the ESA is invoked when the property contains a federally listed threatened or

endangered species that may be affected by a permit decision. In the event that listed species are involved and a Corps permit is required for impacts to jurisdictional waters, the Corps must initiate consultation with USFWS (or the National Marine Fisheries Service, NMFS) pursuant to Section 7 of the ESA (16 USC 1536; 40 CFR § 402). If formal consultation is required, USFWS or NMFS will issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species, recommending reasonable and prudent measures to ensure the continued existence of the species, establishing terms and conditions under which the project may proceed, and authorizing incidental take of the species.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFA) conserves and manages the fishery resources found off the coasts of the United States, the anadromous species, and the Continental Shelf fishery resources of the United States, including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The NMFS enforces the MSFA and regulates commercial and recreational fishing and the management of fisheries resources. The Sustainable Fisheries Act of 1996 amended the MSFA to include new fisheries conservation provisions by emphasizing the importance of fish habitat in regards to the overall productivity and sustainability of U.S. marine fisheries (Public Law 104-267). The revised MSFA mandates the identification and protection of Essential Fish Habitat (EFH) for managed species during the review of projects conducted under federal permits that have the potential to affect such habitat. Federal agencies are required to consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency, which may adversely affect EFH (MSFA 305.b.2).

Under the MSFA, NMFS identifies, conserves, and enhances EFH for those species regulated under a federal fisheries management plan (FMP). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity and includes all associated physical, chemical and biological properties of aquatic habitat that are used by fish. Projects that have the potential to adversely affect EFH must initiate consultation with NMFS. Adverse effects are any impacts that reduce the quality and/or quantity of EFH and can include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). There are four FMPs in California, Oregon, and Washington that identify EFH for groundfish, coastal pelagic species, Pacific salmon, and Pacific highly migratory fisheries.

Central Valley fall/late fall–run Chinook salmon is a Magnuson-Stevens Fishery Conservation and Management Act managed species. This species either spawns of has the potential to spawn in western Placer County streams, that near the project include Antelope Creek, Secret Ravine, and Miners Ravine, which would be considered as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of Central Valley fall/late fall–run Chinook salmon.

Migratory Bird Treaty Act
The federal Migratory Bird Treaty Act is administered by the USFWS. The Act provides that it is unlawful to: pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product unless permitted by regulations. Most bird species within California fall under the provisions of the Act. Excluded species include nonnative species such as house sparrow, starling, and ring-necked pheasant and native game species such as quail.

Fish and Wildlife Coordination Act
The USFWS also has responsibility for project review under the Fish and Wildlife Coordination Act. This statute requires that all federal agencies consult with USFWS, NMFS, and the state's wildlife agency (California Department of Fish and Wildlife, CDFW) for activities that affect, control, or modify streams and other water bodies. Under the authority of the Fish and Wildlife Coordination Act, USFWS, NMFS, and CDFW review applications for permits issued under Section 404 and provide comments to the Corps about potential environmental impacts.

STATE

California Endangered Species Act
The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state-listed endangered and threatened species. CESA requires state agencies to consult with the California Department of Fish and Wildlife (CDFW) when preparing California Environmental Quality Act (CEQA) documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that 'overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The CESA prohibits the taking of state-listed endangered or threatened plant and wildlife species. CDFW exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFW may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFW requires preparation of mitigation plans in accordance with published guidelines.

Section 401 of the Federal Clean Water Act/Porter Cologne Water Quality Act

Pursuant to section 401 of the Federal Clean Water Act, projects that require a Corps permit for the discharge of dredge or fill material must obtain water quality certification that confirms a project complies with state water quality standards before the Corps permit is valid. State

water quality is regulated/administered by the State Water Resources Control Board and its nine Regional Water Quality Control Boards (RWQCB). The state also maintains independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Act.

The California State Water Resource Control Board has developed a general construction storm water permit to implement the requirements for the federal National Pollution Discharge Elimination System (NPDES) permit. The permit requires submittal of a Notice of Intent to comply, fees, and the implementation of a Storm Water Pollution Prevention Plan.

CDFW Species of Special Concern

CDFW tracks species in California whose numbers, reproductive success, or habitat may be threatened. Even though not formally listed under FESA or CESA, such plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFW. CDFW has also designated special-status natural communities which are considered rare in the region, support special status species or otherwise receive some form of regulatory protection. Documentation pertaining to these communities, as well as special status species (including species of special concern), is kept by CDFW as part of the CNDDB.

Natural Community Conservation Planning Act

The Natural Communities Conservation Planning Act (NCCP) program, which began in 1991 under the California Natural Community Conservation Planning Act, is broader in its orientation and objectives than CESA and ESA; these laws are designed to identify and protect individual species that are already listed as threatened or endangered and their habitats. The primary objective of the NCCP program is to conserve natural communities at the ecosystem scale while accommodating compatible land use.

Placer County is currently involved in efforts to prepare the Placer County Conservation Plan, a Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan (NCCP) that may eventually be applicable to projects in the Loomis area. A draft of the HCP/NCCP has not been developed as of the date of this report.

California Department of Fish and Wildlife-Streambed Alteration Agreement

Section 1602 of the California Fish and Game Code requires any person, governmental agency, or public utility proposing any activity that will divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposing to use any material from a streambed, to first notify CDFW of such proposed activity. CDFW may propose reasonable modifications, based on the information contained in the notification form and a possible field inspection, CDFW may propose reasonable modifications in the proposed construction as would allow for the protection of fish and wildlife resources. Upon request, the parties may meet to discuss the modifications. If the parties cannot agree and execute a Lake and Streambed Alteration Agreement, then the matter may be referred to arbitration.

California Department of Fish and Wildlife Fish and Game Code 3503 and 3503.5
Section 3503 of the Fish and Game Code makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird. Section 3503.5 makes it unlawful to take or possess birds of prey (hawks, eagles, vultures, owls) or destroy their nests or eggs.

California Department of Fish and Wildlife Fully Protected Animal Species
The classification of Fully Protected was an effort by the State of California in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Most Fully-Protected species have also been listed as threatened or endangered species under state endangered species laws and regulations. Species classified as Fully Protected Species by the CDFW may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock (as per California Fish and Game Code Section 3511(a)(1)).

Public Resources Code Section 21084.4 for Oak Woodlands Conservation
As of January 2005, Public Resources Code Section 21083.4 requires California Counties acting as Lead Agencies under CEQA to determine whether a project "may result in a conversion of oak woodlands that will have a significant effect on the environment." If individual or cumulative impacts to oak woodlands are identified, the law requires that the impacts be mitigated. Acceptable mitigation measures include, but are not limited to, conservation of other oak woodlands through the use of conservation easements, planting replacement trees which must be maintained for seven years, contribution to the Oak Woodland Conservation Fund established under Section 1363(a) of the Fish and Game Code, or other measures.

LOCAL

Placer County General Plan
In addition to federal and state regulations, the development of the property must be accomplished consistent with the land use designations and natural resource and other policies of the Placer County General Plan.

OTHER STATUTES, CODES, AND POLICIES AFFORDING LIMITIED PROTECTION

California Native Plant Society
The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of California (CNPS 2014: https://www.cnps.org/cnps/rareplants/inventory/). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings: https://www.cnps.org/cnps/rareplants/ranking.php

California Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere.

California Rare Plant Rank1B: Plants rare, threatened, or endangered in California and elsewhere.
California Rare Plant Rank 2A: Plants presumed extirpated in California, but more common elsewhere.
California Rare Plant Rank 2B: Plants rare, threatened, or endangered in California, but more numerous elsewhere.
California Rare Plant Rank 3: Plants about which more information is needed – a review list.
California Rare Plant Rank 4: Plants of limited distribution – a watch list.

5.0 IMPACTS AND MITIGATION MEASURES

5.1 Standards of Significance

According to the Environmental Checklist in Appendix G of the CEQA Guidelines (Title 14, California Code of Regulations, 15000 et seq.), the project would be considered to have a significant impact on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Wildlife and Game or U.S. Fish and Wildlife Service.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.2 Relevant Project Characteristics

Costco Wholesale is proposing to construct Costco warehouse facility on the property. A plan view of conceptual design for the configuration of proposed project can be seen in Figure 4. The Preliminary Grading and Drainage Plan is shown in Figure 5. The facility includes the Costco warehouse and associated parking and other infrastructure. The proposed project would cover the entire site.

5.3 Impacts and Mitigation Measures

5.3.1 Plant Communities and Vegetation

Impacts to biological resources will result from vegetation removal due to the conversion of upland areas composed of Annual Grassland, Valley Oak Woodland and Valley Freshwater

Marsh to accommodate the proposed Costco facility. The acreage of each of the vegetation communities found on the property, and impacts resulting from site development as planned are shown in Table A. Figure 10 shows the development footprint as an overlay of the vegetation communities found on the project site. The footprint for the proposed project would cover 100% of the site.

TABLE A. IMPACTS TO VEGETATION COMMUNITIES

Habitat Type	Existing Acreage in Overall Study Area (acres)	Impacted Acreage (acres)
Annual Grassland	10.16	10.16
Valley Freshwater Marsh	0.15	0.15
Valley Oak Woodland	7.96	7.96
TOTAL	**18.27**	**18.27**

Wetlands and Waters of the U.S.

Wetlands and waters of the U.S. are regulated by state and federal agencies and would be considered sensitive natural communities as defined by CEQA. Impacts to waters of the U.S. would be potentially significant if appropriate mitigation was not implemented for all regulated wetlands as required by state and federal regulations.

The ecological constraints to development at the site include approximately 0.15 acres of wetlands and waters of the U.S. potentially subject to Corps jurisdiction pursuant to Section 404 of the Federal Clean Water Act as shown in Figure 9. As the palustrine emergent wetlands are located in various portions of the site, complete avoidance of jurisdictional wetlands would not be possible. Impacts to wetlands and waters of the U.S. potentially subject to Corps jurisdiction are shown in Figure 11. The development plan for the site would permanently impact 0.15 acres of palustrine emergent wetlands located on the site that are potentially under the jurisdiction of the Corps under Clean Water Act Section 404. Without mitigation, project impacts to wetlands or waters of the U.S. would be significant.

Impact 1: Direct (fill) impacts to 0.15 acres of waters of the U.S. would result from implementation of the proposed Costco warehouse facility.

> **Mitigation Measure 1:** The developer will submit applications for a Nationwide permit from the Corps of Engineers (see Section 4.5, Permit Requirements), and Section 401 water quality certification from the Central Valley Regional Water Quality Control Board (RWQCB), required for the Corps permit to be valid. Appropriate wetland mitigation would be required by the Corps and RWQCB for impacts to the 0.15 acres of seasonal wetlands located at the site, and a wetland mitigation plan to mitigate impacts to

jurisdictional areas would need to be developed as part of the Corps and RWQCB permit process. Corps jurisdictional areas must be replaced at a minimum 1:1 ratio through wetland creation (preferably on-site) to ensure that no net loss of acreage or functions and values to these areas occurs. Options for providing mitigation include creation of wetlands on site or contributions to an agency-approved wetland mitigation bank. As the footprint of the proposed project requires use of most, if not all, of the site, the preferred method of mitigation is through contributions to an agency-approved mitigation bank.

Oak Woodlands

Project construction would result in the loss of approximately 7.96 acres of Valley Oak Woodland habitat on the site (see Figure 10). Tree removal and impact to oak woodland habitat was assumed within the graded footprint of the project, and included all trees on the property.

Mann Made Resources (see Attachment 3) determined that the project would result in the removal of 372 trees determined to be of protected size. Of these 372 trees, 162 were found to be in good and fair condition and would require mitigation pursuant to the Town of Loomis Tree Ordinance. The arborist considered the condition of each of these 162 and species of tree in calculating a total mitigation planting requirement of potentially 290 #15 container trees. It should be possible to plant these trees on the property as part of the project landscape design and parking lot shade.

Oaks woodlands provide significant wildlife habitat value. Oak woodlands are protected by the California Department of Fish and Game, State of California regulations including Public Resources Code Section 21083.4, and policies of the Town of Loomis. Public Resources Code Section 21083.4 directs Counties to mitigate significant effects of oak woodland conversion, and would not apply to a project reviewed by the Town of Loomis as a CEQA Lead Agency.

Impact 2: The project would require construction within 7.96 acres of Valley Oak Woodland habitat and the direct removal of 372 mature trees determined to be of protected size.

> **Mitigation Measure 2:** The applicant shall prepare an Oak Woodland Tree Replacement and Protection Plan including: (i) planting of 290 #15 container trees as recommended by the arborist to attain tree replacement ratios prescribed by the Town of Loomis; (ii) the specific location of the tree planting, (including a map and planting plan); (iii) schedules and methodologies for maintaining and monitoring the success of the Plan; and (iv) performance standards.

Landscaping/Invasive Species

Invasive, exotic weeds compete with native vegetation and can degrade the quality of wildlife habitats. Project landscaping and construction activity has the potential to introduce invasive, exotic, non-native vegetation, some of which may not now exist in the area. Also, highways and various construction projects provide a pathway for dispersal of invasive plants. Invasive

plant species include those designated as noxious weeds by the U.S. Department of Agriculture, problem species listed by the California Department of Food and Agriculture, and other invasive plants designated by the California Invasive Plant Council. Where appropriate, vegetation removed because of project activities should be replaced with native species which are of value to local wildlife. Native plants generally are more valuable as wildlife food sources and require less irrigation, fertilizers, and pesticides than exotic species.

Impact 3: Project landscaping is expected to introduce exotic, non-native vegetation, some of which may not exist in the area.

> **Mitigation Measure 3:** Landscaping shall be designed to enhance the wildlife value and aesthetic quality of undeveloped portions of the project site. Where appropriate, vegetation removed because of project activities shall be replaced with native species which are of value to local wildlife, and native vegetation shall be retained. Weed management practices may be warranted, including identification and removal of infestations of noxious weeds prior to construction, use of construction equipment and materials such as fill and erosion control devices that are known to be weed-free, power-washing of construction vehicles to remove mud, dirt and vegetative material before working in relatively weed-free areas, and removal of invasive species from undeveloped areas within the project boundary.

5.3.2 Animal Species

Loss of vegetation associated with the habitats on site will disrupt and displace existing wildlife. Some bird roosting, nesting, and foraging areas will be eliminated. Reptiles, amphibians, and small mammals that utilize these areas will be displaced to remaining undisturbed areas. Open space areas near the project area should be capable of accommodating these species. Animal species that have adapted to living in close association with human disturbance can be expected to increase after the proposed project. These species include mammals such as raccoon, California ground squirrel, deer mouse, and house mouse, and birds such as rock pigeon, Eurasian-collared dove, American robin, European starling, house sparrow, Brewer's blackbird and brown-headed cowbird.

Nesting Birds

Nesting bird species protected by the federal Migratory Bird Treaty Act could be impacted during project construction. Evidence of nesting by bird species protected by the MBTA was observed at the Project Site during the April 22, 2017 field survey. The removal of trees and shrubs during the February 1 to August 31 breeding season could result in mortality of nesting avian species if they are present. Therefore, preconstruction surveys should be conducted of the development area to determine if nesting is occurring. If nests are found, a construction plan would need to be developed that would allow successful nesting (fledging of young birds).

Many species of raptors (birds of prey) are sensitive to human incursion and construction activities. Field surveys conducted by HBG in April of 2017 revealed that red-shouldered hawk

may nest at the site or in the immediate project vicinity. Therefore, to ensure that nesting raptor species are not present near the construction site, preconstruction surveys should include a thorough search for nesting raptor species, including raptor species of special status such as Swainson's hawk and burrowing owl, among others (see Mitigation Measure #7 below). Even though the Project Site does not contain suitable habitats for nesting by special status bird species such as tricolored blackbird and loggerhead shrike, preconstruction surveys should include searches for these species to ensure nests of these species, if they were to found at the site, are not harmed.

Impact 4: The removal of vegetation during the February 1 to August 31 breeding season could result in mortality of nesting avian species if they are present.

> **Mitigation Measure 4:** If feasible, construction work should take place outside of the February 1 to August 31 breeding window for nesting birds. If construction is to be conducted during the breeding season, a qualified biologist shall conduct a pre-construction breeding bird survey in areas of suitable habitat within 15 days prior to the onset of construction activity. If bird nests are found, appropriate buffer zones shall be established around all active nests to protect nesting adults and their young from construction disturbance. Size of buffer zones shall be determined in consultation with wildlife agency staff based on site conditions and species involved. Buffer zones shall be maintained until it can be documented that either the nest has failed or the young have fledged. Preconstruction surveys shall include appropriate survey for nesting species of raptor, including special status raptor species (see Mitigation Measure #7) and other avian species with special status and with a small chance of occurring on the Project Site, such as tricolored blackbird and loggerhead shrike.

Water Quality

Construction activities on the project site would involve disturbance and exposure of soils through grading and removal of vegetative cover, installation of infrastructure, and other activities. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could cause increased sedimentation and turbidity in surface waters outside of the Project Site, resulting in degradation of water quality. Water from the Project Site drains west toward the adjacent property and then into Sucker Ravine, which drains into Secret Ravine. Secret Ravine is a tributary of Miners Ravine, which ultimately reaches Dry Creek and then the American River.

Ground-disturbing activities could promote erosion and allow elevated levels of sediment to wash into downstream creeks, where potential impacts to fish and wildlife species would be possible. In the absence of water quality controls, indirect impacts to animal populations in wetlands and other aquatic habitats could result from the proposed project due to elevated contaminants in stormwater runoff. However, the requirement for the implementation of a Stormwater Pollution Prevention Plan (SWPPP), with identification of proper construction techniques and Best Management Practices (BMPs) will minimize adverse effects associated with these activities. Furthermore, standard techniques to control contaminants in stormwater

such as oil and grease traps will be employed to mitigate water quality concerns.

Impact 5: Placement of fill and other ground disturbing activities could promote erosion and allow elevated levels of sediment to wash into downstream aquatic areas, potentially affecting fish and wildlife resources.

> **Mitigation Measure 5:** Best Management Practices and all requirements as detailed in the Stormwater Pollution Prevention Plan shall be implemented to control erosion and migration of sediments off-site. Implementation of water quality controls shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. In addition, vegetation shall only be cleared from the permitted construction footprint. Areas cleared of vegetation, pavement, or other substrates shall be stabilized as quickly as possible to prevent erosion and runoff.

Essential Fish Habitat

Antelope Creek, Secret Ravine and Miners Ravine would be considered as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of Central Valley fall/late fall–run Chinook salmon. Secret Ravine and Miners Ravine are located about four miles southwest of the Project Site; runoff from the site drains over the adjacent property to the west and then into Sucker Ravine which drains into Secret Ravine. Portions of Antelope Creek run approximately 0.7 miles to the northwest of the Project Site, but drainage flow is not in the direction of the creek. An unnamed drainage located just north of the property is a tributary to Antelope Creek.

In the absence of water quality controls, indirect impacts to EFH for Central Valley fall/late fall-run Chinook salmon could result from the proposed project due to elevated contaminants in stormwater runoff that eventually flow into Secret Ravine. However, the requirement for the implementation of a Stormwater Pollution Prevention Plan (SWPPP), with identification of proper construction techniques and Best Management Practices (BMPs) will minimize adverse effects associated with these activities (see Mitigation Measure 5). Furthermore, standard techniques to control contaminants in stormwater such as oil and grease traps will be employed to mitigate water quality concerns.

5.3.3 Special Status Species

A review of habitat requirements of sensitive animal species documented by the CNDDB as occurring in the project vicinity, and sensitive animal species known to occur in the general vicinity, was conducted by HBG. Animal species of special concern are present or possible as described below.

Special Status Plants

Habitat conditions at the Project Site are potentially suitable to support several species of special status plant, but no special status plants were found during protocol rare plant surveys

of the property conducted by a qualified botanist during the spring/summer 2017 flowering period of target species. No impacts to special status plant species would result from construction of the proposed project.

Special Status Animals

Vernal Pool Crustaceans -The seasonal wetland swales within the several drainages on the property do not provide suitable habitat for listed species of vernal pool crustaceans. The swales are flowing systems lacking the inundation characteristics that would support VPFS or VPTS. The drainages are also not suitable habitat for the California linderiella. No impacts to vernal pool fairy shrimp, vernal pool tadpole shrimp, or California linderiella would result from project development.

Steelhead Central Valley DPS- In the project area, Central Valley steelhead are found in Dry Creek and its tributaries in Secret Ravine and Miners Ravine, located as close as about 4 miles from the Project Site. No direct impacts would occur to steelhead habitat as no spawning or rearing habitat or occupied tributary streams are found on the Project Site. However, uncontrolled erosion from the developed site could result in consequent downstream sedimentation that could adversely affect spawning areas in Secret Ravine or Miners Ravine, and untreated stormwater runoff from onsite impervious surfaces could introduce contaminants that could adversely affect water quality that currently supports the life cycle of steelhead in these tributaries. Implementation of Mitigation Measure 5, with requirements to implement Best Management Practices as part of a Stormwater Pollution Prevention Plan to control erosion and migration of sediments off-site and other water quality control practices, will ensure that impacts to local steelhead populations do not occur.

Western Spadefoot Toad- The project site is within the range of western spadefoot toad and wetland WS-1 is marginally suitable to support the species. No western spadefoot toad adults or larvae were observed during April 2017 field studies. As there is a remote possibility that western spadefoot toad could be present on the site, a preconstruction survey for this species is warranted.

Impact 6: Construction could impact western spadefoot toad if individuals of the species were present on the property.

> **Mitigation Measure 6:** Preconstruction surveys of all ponded habitats shall be conducted for western spadefoot toad, and any western spadefoot toad encountered within the construction footprint shall be allowed to move out of harm's way of its own volition or a qualified biologist will relocate it to a burrow outside of the construction impact area. For work conducted during the western spadefoot toad migration and breeding season (November 1 to May 31), a qualified biologist will survey active work areas in mornings following measurable precipitation events, with construction commencing only once the biologist has confirmed that no spadefoot toads are in the work area.

Swainson's Hawk- Swainson's hawk is much more likely to nest in trees near riparian habitats or agricultural fields on the Valley floor rather than in oak woodland in the foothills, such as found at the Project Site. Although a single Swainson's hawk was observed flying over the Project Site during the April 22, 2017 field review, nesting by Swainson's hawk at the Project Site is unlikely. Use of the Project Site by this species is probably limited to occasional visits while foraging or during migration. No impacts to Swainson's hawk breeding or foraging habitat is anticipated due to project development. Mitigation measures for preconstruction surveys of nesting birds include inclusion of this species in the surveys.

Burrowing Owl- No burrowing owls, California ground squirrel colonies or California ground squirrels were observed during field reviews conducted in either February or April or 2017. In addition, heights of grasses within the onsite grassland are too tall to provide habitat for burrowing owl, which prefers grasslands with low profile vegetation. No impacts to burrowing owl breeding or wintering habitat is anticipated due to project development. Nevertheless, mitigation measures for preconstruction surveys of nesting birds are recommended to include of this species in the surveys.

Tricolored Blackbird- Vegetation within the onsite wetland swales is not of a type that would be preferred to support a nesting colony of tricolored blackbird. Surveys of the site by an HBG wildlife biologist in April 2017 found no evidence of use of the site by tricolored blackbird. No impacts to tricolored blackbird would result from project development. Mitigation measures for preconstruction surveys of nesting birds are recommended to include this species in the surveys.

Special Status Raptor Species- Six raptor species designated with special status by the State of California have a potential to nest at the site. These species include burrowing owl (State Species of Special Concern and Federal Bird Species of Conservation Concern), Northern harrier (State Species of Special Concern and Federal Bird Species of Conservation Concern), white-tailed kite (California Fully Protected), Cooper's hawk (California Watch List Species), Sharp-shinned hawk (California Watch List Species) and Swainson's hawk (state-listed threatened). Preconstruction surveys for tree-nesting special status raptor species (e.g., white-tailed kite, Cooper's hawk, sharp-shinned hawk, Swainson's hawk) will be necessary if tree removal occurs during the February 1 to August 31 nesting season. Preconstruction surveys for ground-nesting special status raptor species (Northern harrier and burrowing owl) would be necessary prior to any ground disturbance in grasslands.

Impact 7: Construction during the nesting season could impact any of six raptor species designated with special status by the State of California: burrowing owl, Northern harrier, white-tailed kite, Cooper's hawk, sharp-shinned hawk, and Swainson's hawk.

> **Mitigation Measure 7:** Preconstruction surveys conducted for nesting birds pursuant to the MBTA shall include specific preconstruction surveys for special status species of raptors. Preconstruction surveys for special status tree-nesting raptor species (white-tailed kite, Cooper's hawk, sharp-shinned hawk, Swainson's hawk) will be necessary if

tree removal occurs during the February 1 to August 31 nesting season. A preconstruction survey for ground-nesting special status raptor species (Northern harrier and burrowing owl) shall be conducted to ensure impacts to ground-nesting species do not occur. Preconstruction surveys shall be conducted within 15 days of initiation of construction activity. If an active raptor nest is identified, appropriate mitigation measures shall be developed and implemented in consultation with CDFW. Mitigation will include development of a construction plan that establishes buffer zones around active nests during construction activity and/or until young have fledged.

6.0 AGENCY PERMIT REQUIREMENTS

Any potential impacts to jurisdictional wetlands or waters of the U.S. at the site will require authorization from the Army Corps of Engineers pursuant to Section 404 of the Clean Water Act. NWP 39 authorizes "discharges of dredged or fill material into non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters, for the construction or expansion of residential, commercial, and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures" provided the activities meet the following criteria:

- The discharge does not cause the loss of greater than 0.5-acre of non-tidal waters of the U.S.;
- The discharge does not cause the loss of greater than 300 linear feet of a stream bed (unless the criterion is waived by the District Engineer);
- The discharge is part of a single and complete project;
- The permittee avoids and minimizes discharges into waters of the U.S. to the maximum extent practicable;
- The discharge does not cause more than minimal degradation of water quality or more than minimal changes to stream flow characteristics; and
- The permittee establishes and maintains vegetated buffers next to open water to the maximum extent practicable.

As the 0.15 acres of seasonal wetlands are scattered throughout the site and avoidance of these wetlands would be problematic with any layout of land uses, a permit from the Corps is a certainty for development at this site. Wetland impacts would not exceed the 0.5-acre limit of Nationwide Permit 39; therefore, the Corps would determine that the proposed project would qualify for a Nationwide Permit 39 and an Individual Permit would not be required. A wetland mitigation plan describing procedures to mitigate impacts to jurisdictional areas would need to be developed as part of the Corps permit process. The applicant would need to demonstrate that wetlands have been avoided to the extent possible and provide documentation of how the project has been minimized to reduce onsite impacts.

The requirement for a Clean Water Act Section 404 Nationwide permit means that any development project at this site will also require Section 401 water quality certification from the Central Valley Regional Water Quality Control Board (RWQCB) for the Corps permit to be valid. Prior to issuance of the water quality certification, RWQCB will require the applicant to demonstrate that requirements of the County of Placer pursuant to the California Environmental Quality Act (CEQA) have been satisfied. Mitigation of wetlands will be required to obtain Corps and RWQCB approval. It does not appear as though A Section 7 consultation with USFWS or NOAA Fisheries/NMFS would be warranted as neither federally-listed species nor their habitats would not be adversely affected by project development. An Essential Fish Habitat evaluation conducted in conjunction with NMFS is also not likely warranted.

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ATTACHMENT 1

Figures

Figure 1. Project Location
Figure 2. U.S.G.S Map of the Project Site
Figure 3. Aerial Photo of the Project Site
Figure 4. Costco Wholesale Project Conceptual Plan
Figure 5. Preliminary Grading and Drainage Plan
Figure 6. Soil Map of the Project Area
Figure 7. Watershed Map of the Project Area
Figure 8. Map of Vegetation Communities at the Project Site
Figure 9. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction
Figure 10. Impacts to Vegetation Communities Occurring on the Project Site
Figure 11. Impacts to Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction

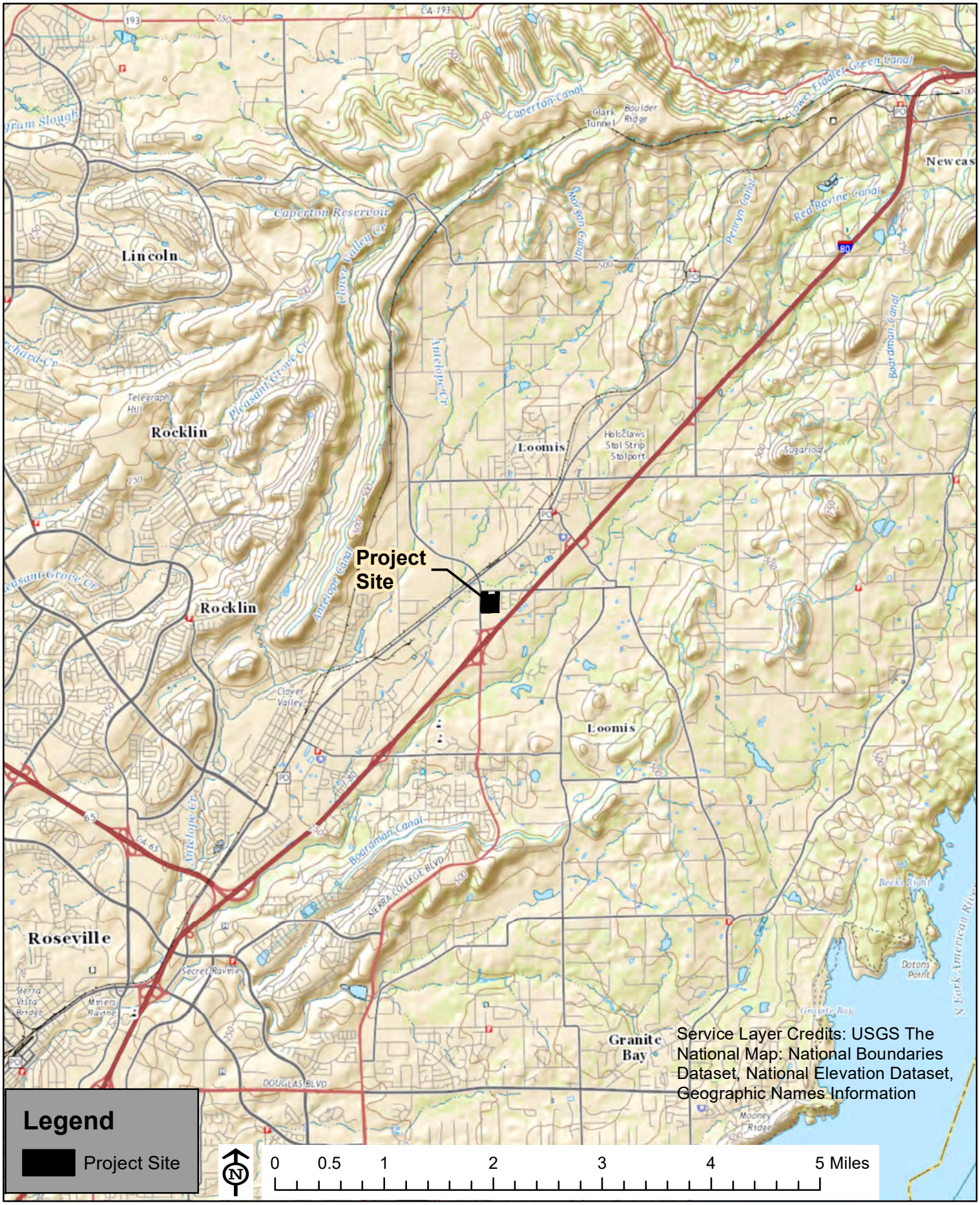


Figure 1. Project Location

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

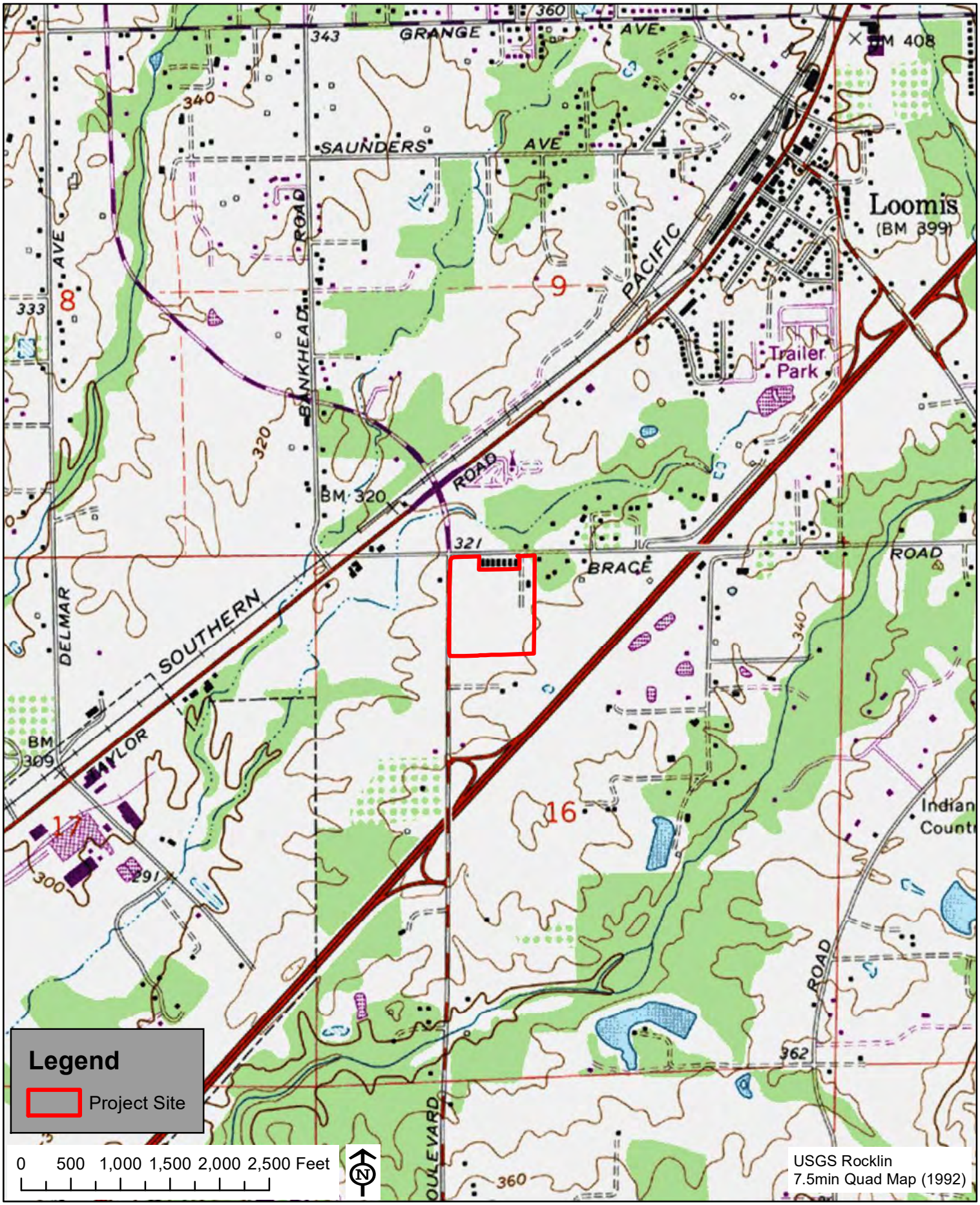


Figure 2. U.S.G.S Map of the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

Figure 3. Aerial Photo of the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

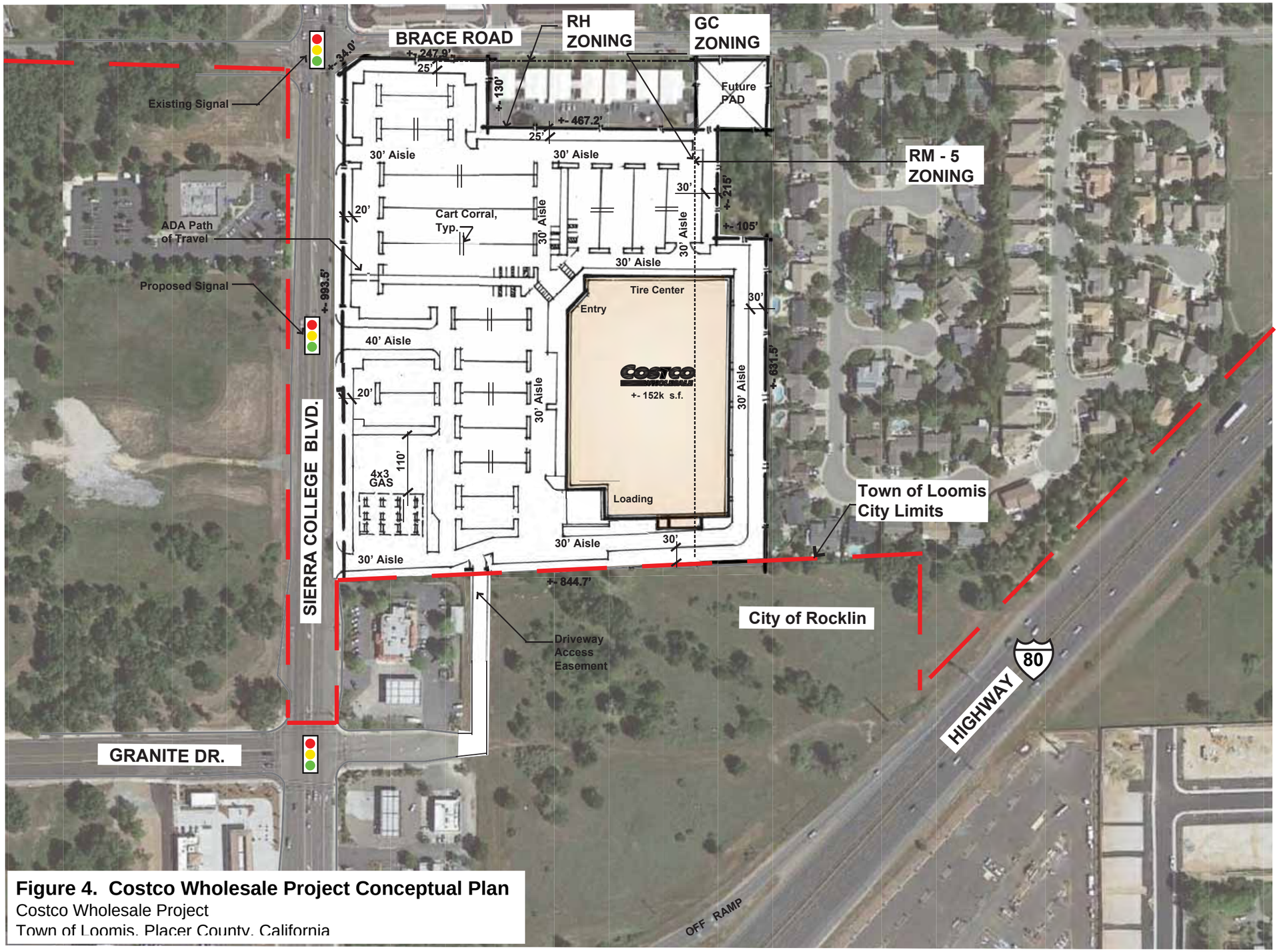


Figure 4. Costco Wholesale Project Conceptual Plan
Costco Wholesale Project
Town of Loomis, Placer County, California

Project Data

Client:	Costco Wholesale 999 Lake Drive Issaquah, WA 98027
Project Address:	Sierra College Blvd., Loomis, CA Town of Loomis

Site Data

Costco Site Area: Total:	±17.2 AC (±750,120 s.f.)
Jurisdiction:	Town of Loomis , CA
Zoning:	GC - General Commercial RM - 5 Medium Density Residential
Boundary Information:	This plan has been prepared using record information from Assessor's Parcel Maps and is for Preliminary use only. All dimensions and acreages are approximate only.

Building Data

Total:	+- 152, 101 s.f.
No Gas Expansion	

Parking Data

10' wide stalls:	774 stalls
Accessible stalls:	16 stalls
Total Parking:	790 Stalls (5.2/ 1,000)
Required Parking	760 (5.0 / 1,000)

DBA# P.256

DB+A

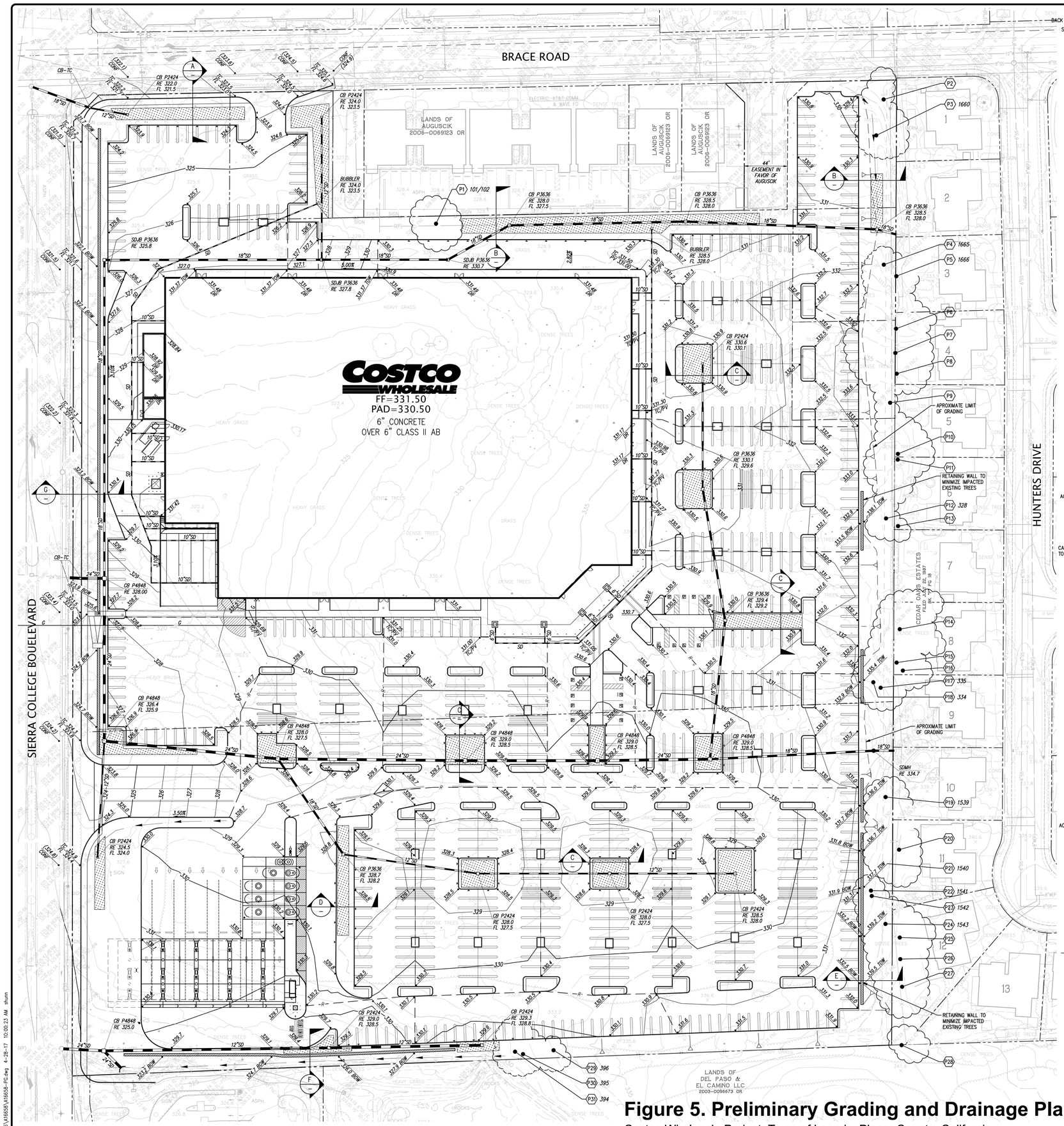
DAVID BABCOCK + ASSOCIATES
ARCHITECTURE LANDSCAPE PLANNING
3581 MT. DIABLO BLVD. , SUITE 235
LAFAYETTE, CALIFORNIA 94549
T: 925.283.5070

COSTCO LOOMIS

PRELIMINARY CONCEPT SITE PLAN 1.2

0 75' 100' 200'
SCALE 1"= 200'
MAY 3, 2016
NORTH

SHEET 1 of 1



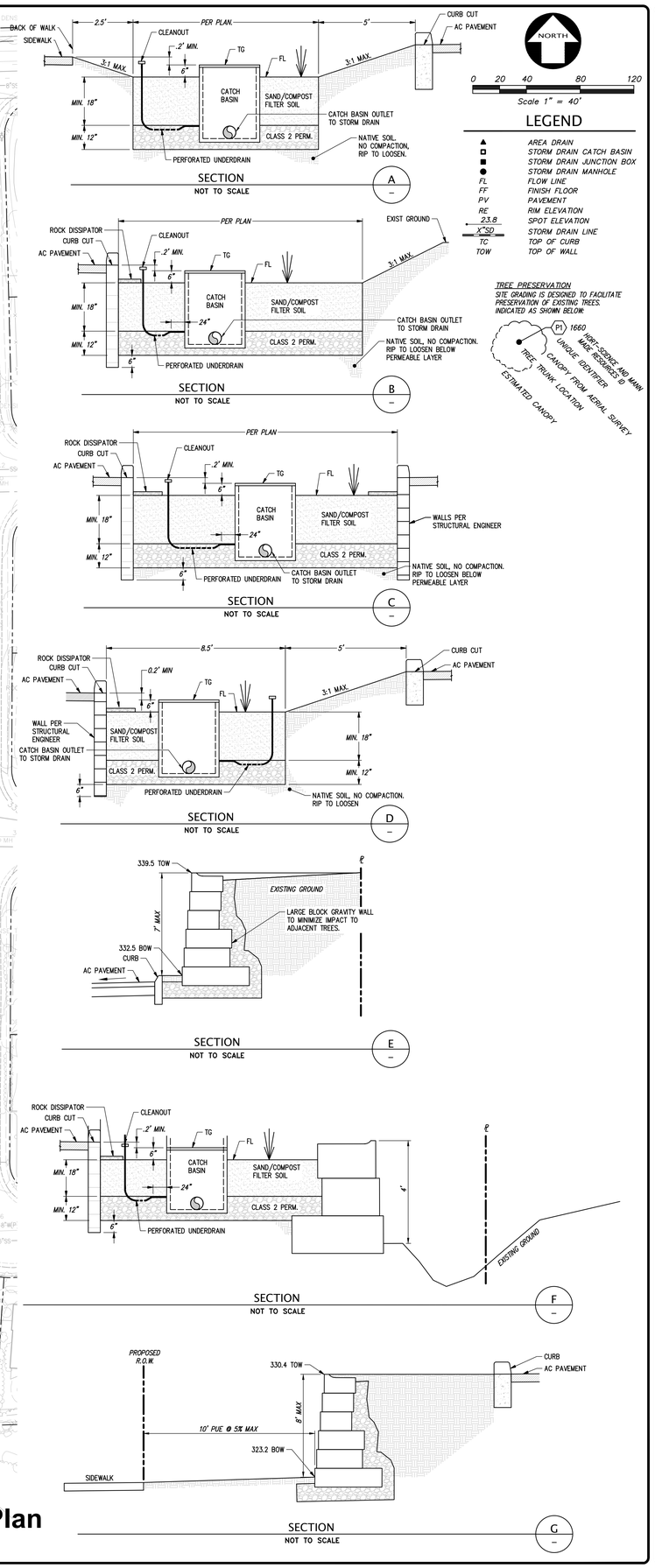


Figure 5. Preliminary Grading and Drainage Plan

Costco Wholesale Project, Town of Loomis, Placer County, California

NO.	BY	REVISION

NO.	BY	REVISION

KIER & WRIGHT
CIVIL ENGINEERS & SURVEYORS, INC.
2850 Collier Canyon Road
Livermore, California 94551
Phone (925) 245-8788
Fax (925) 245-8796

PRELIMINARY GRADING AND DRAINAGE PLAN
OF
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
FOR
COSTCO WHOLESALE CORP.

LOOMIS, CALIFORNIA

DATE	04/14/2017
SCALE	1" = 40'
DESIGNER	SJH
JOB NO.	A16658
SHEET	C4
OF	6 SHEETS

Figure 6. Soil Map of the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
ENVIRONMENTAL REGULATORY CONSULTANTS

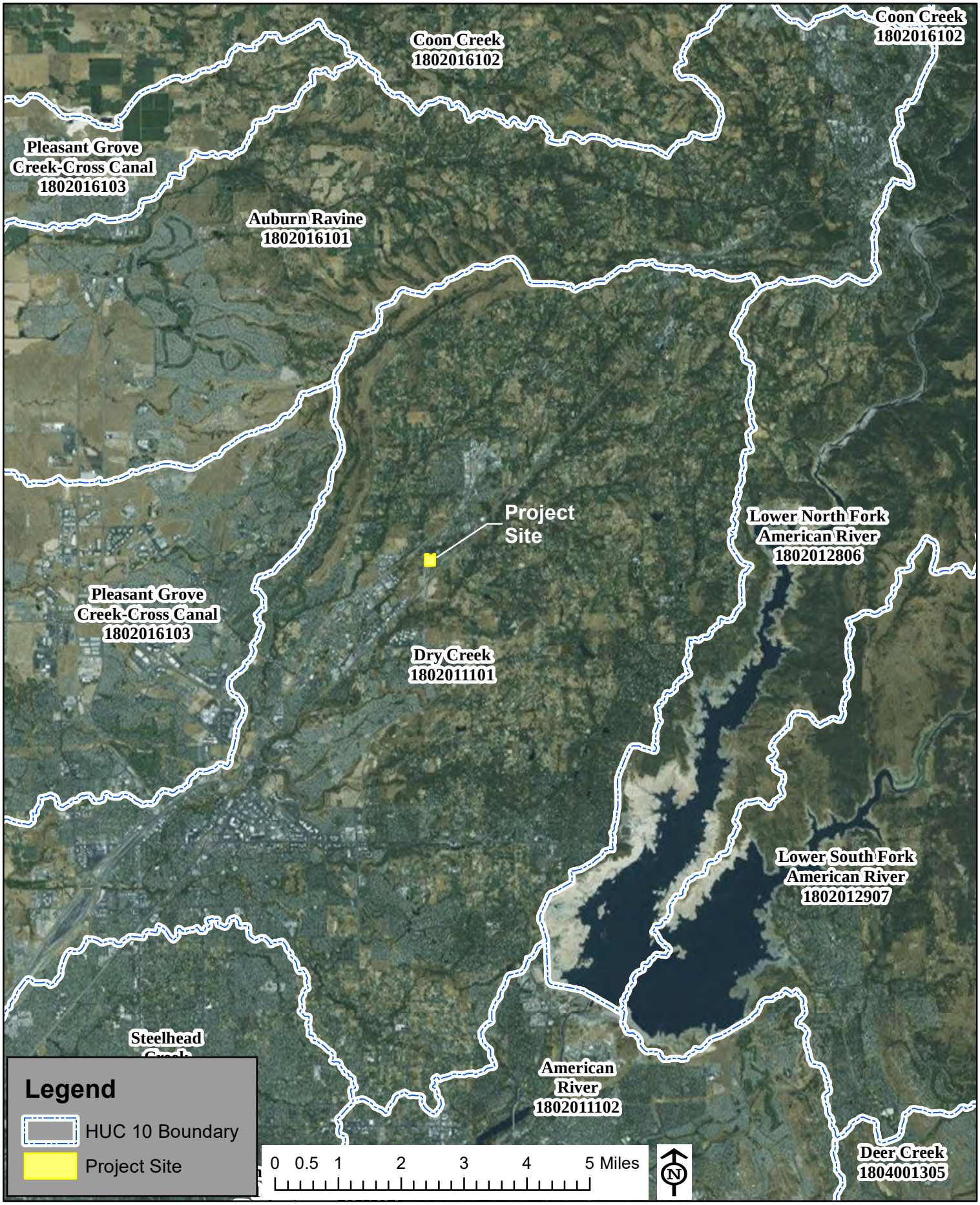


Figure 7. Watershed Map of the Project Area

Costco Wholesale Project
Town of Loomis, Placer County, California

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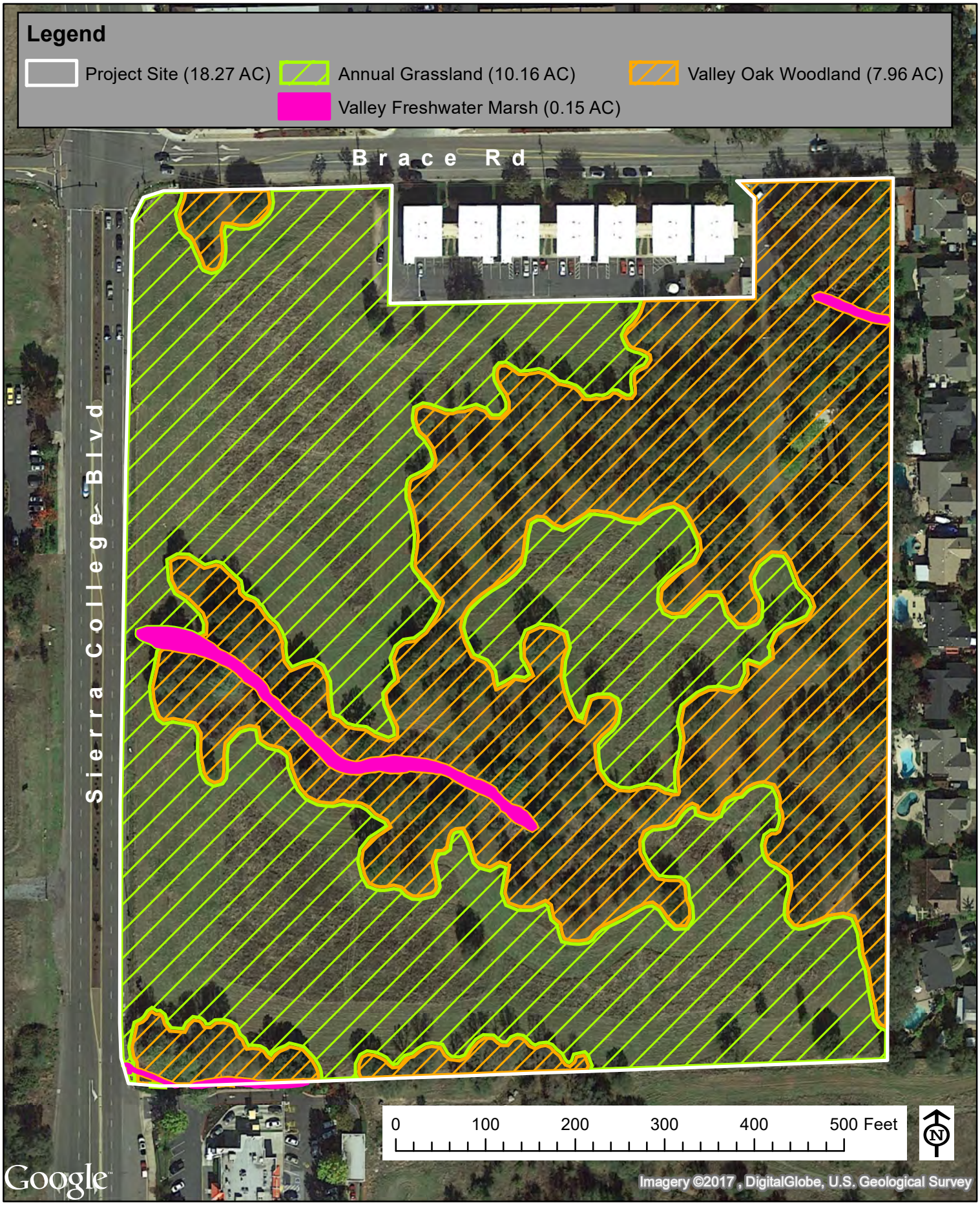

Figure 8. Map of Vegetation Communities at the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

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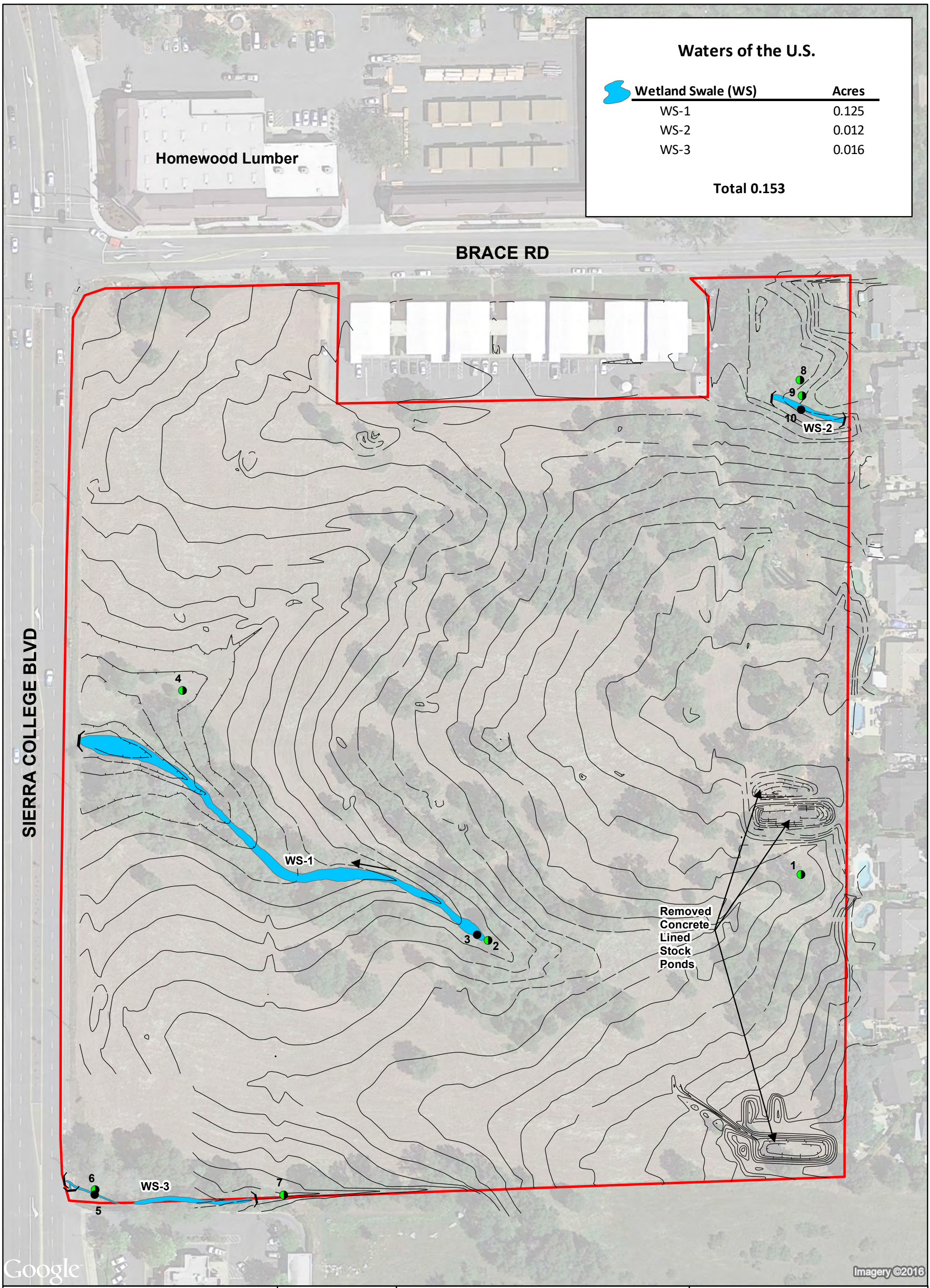

Prepared By:

Salix consulting, inc.

Prepared For:
Manikas Properties
1817 Maryal Drive, Suite 100
Sacramento, CA 95864

N

0 50 100
Feet

Legend

- Study Area (±18.20 acres)
- Culvert
- Wetland Data Point
- Upland Data Point

Figure 5

WETLAND DELINEATION

Sierra-Brace

Town of Loomis, Placer County, CA

April 18, 2016

Figure 9. Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction
Costco Wholesale Project
Town of Loomis, Placer County, California

NOTES: Revised wetland delineation conducted March 2016. Original delineation conducted by Pat Britton and Barry Anderson of North Fork Associates in 2007.

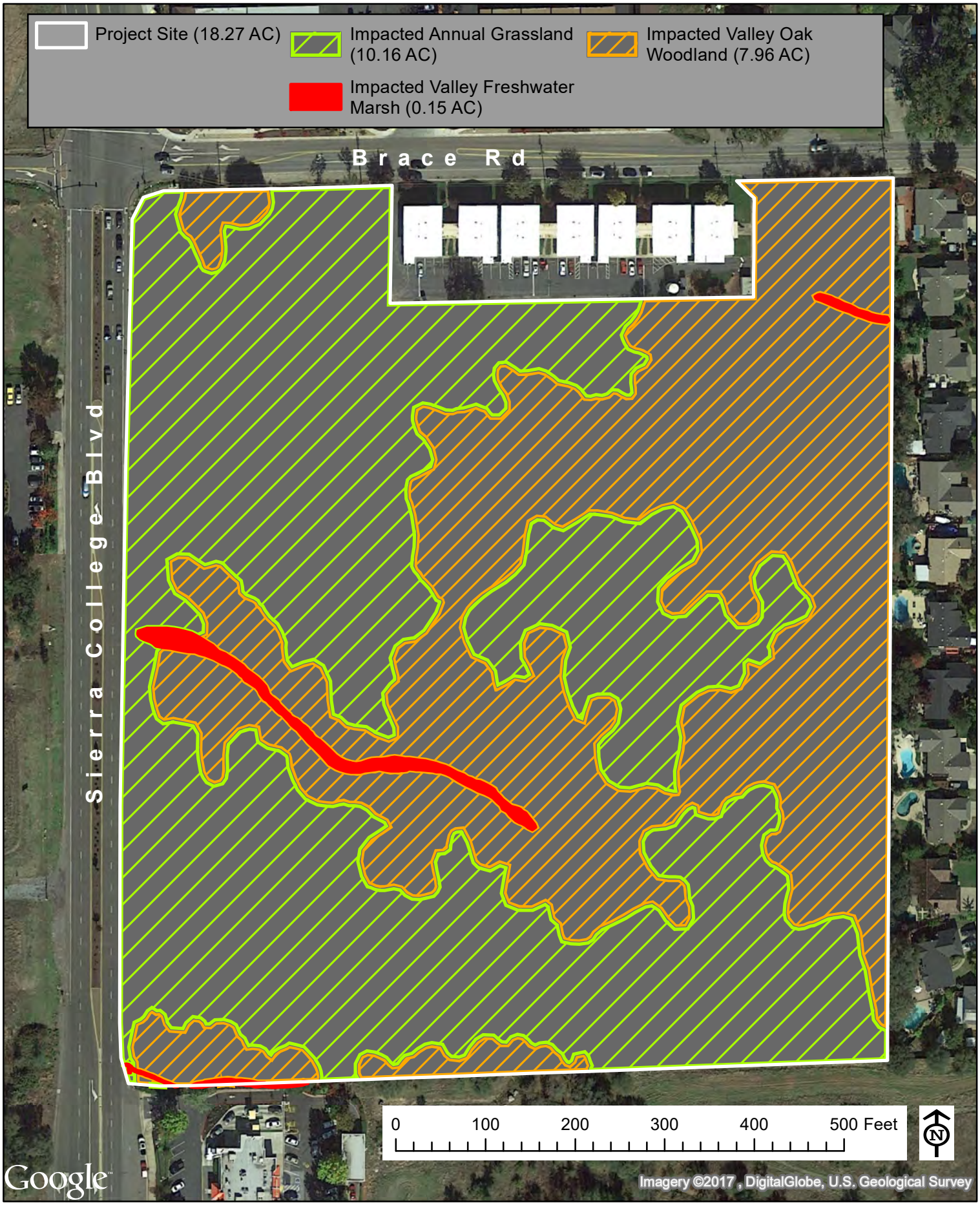

Figure 10. Impacts to Vegetation Communities Occurring on the Project Site

Costco Wholesale Project
Town of Loomis, Placer County, California

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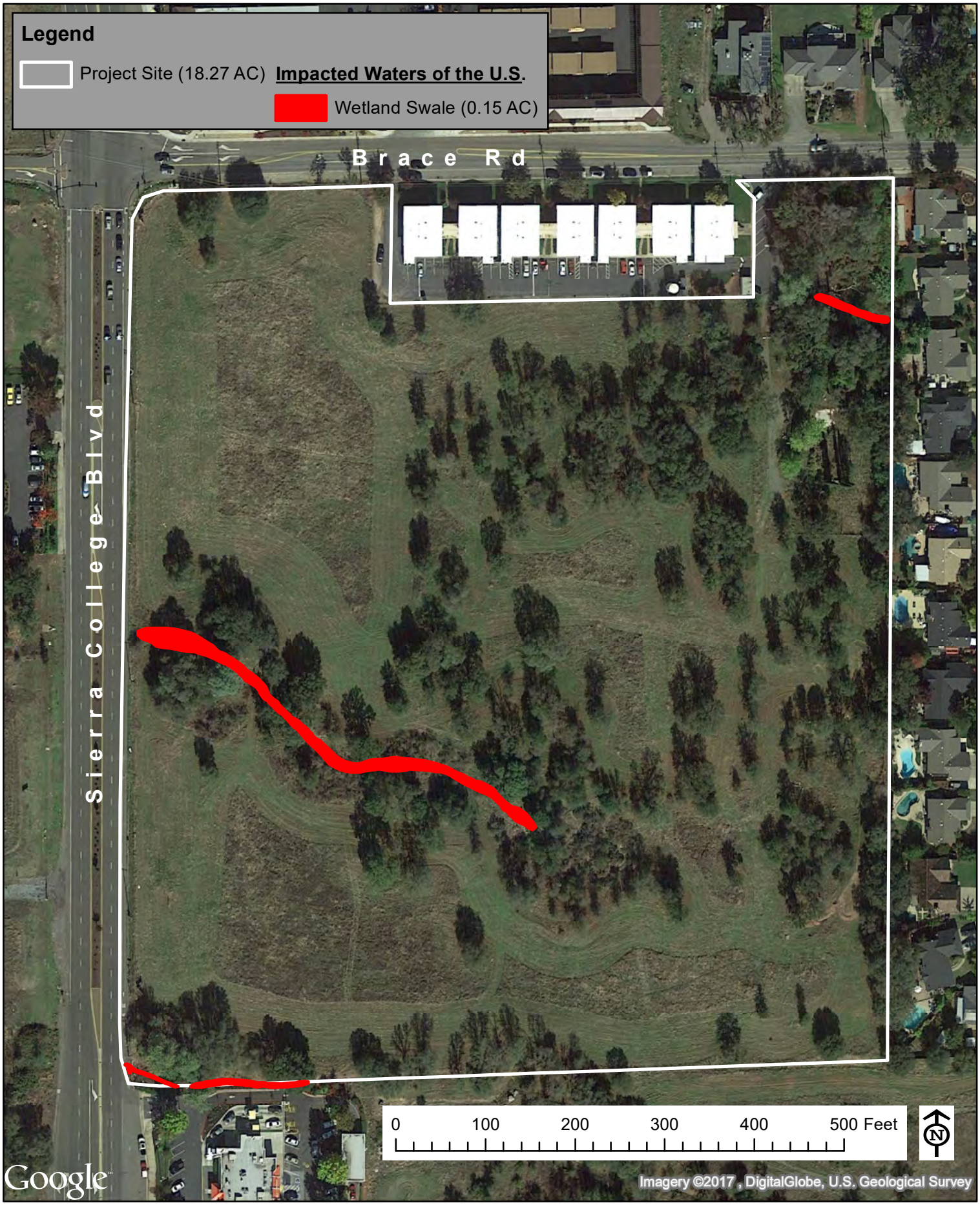

Figure 11. Impacts to Wetlands and Waters of the U.S. Potentially Subject to Corps Jurisdiction

Costco Wholesale Project
Town of Loomis, Placer County, California

Huffman-Broadway Group, Inc.
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ATTACHMENT 2

SUPPLEMENTAL BIOLOGICAL INFORMATION

Table 1. Plant List for Property

Table 2. Animal Species Observed on the Project Site or Expected to Utilize the Project Site

Table 3. Special Status Plants Known to Occur in the Vicinity of the Project Area, Placer County, California

Table 4. Special Status Animal Species that have been Reported in the Vicinity of the Project Area, Placer County, California

TABLE 1. PLANT LIST FOR THE PROPERTY

Scientific Name	Common Name	Wetland Status
Acacia baileyana	Cootamundra wattle	UPL
Acmispon americanus var. americanus	Spanish-clover	UPL
Alisma triviale	California water plantain	OBL
Amsinckia menziesii	common fiddleneck	UPL
Artemisia douglasiana	California mugwort	FAC
Arundo donax	Giant reed	FACW
Avena fatua	Wild oat	UPL
Baccharis pilularis	Coyote brush	UPL
Briza minor	Small quaking grass	FAC
Bromus diandrus	Ripgut grass	UPL
Bromus hordeaceus	Soft chess	FACU
Carduus pycnocephalus	Italian thistle	UPL
Castilleja attenuata	Valley tassles	UPL
Centaurea solstitialis	Yellow starthistle	UPL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canada thistle	FACU
Clarkia sp.	Clarkia	UPL
Claytonia perfoliata	Common miner's lettuce	FAC
Convolvulus arvensis	Bindweed	UPL
Cynodon dactylon	Bermudagrass	FACU
Cynosurus echinatus	Hedgehog dogtail	UPL
Cyperus eragrostis	Tall flatsedge	FACW
Cytisus scoparius	Scotch broom	UPL
Elymus caput-medusae	Medusahead	UPL
Epilobium brachycarpum	Summer cottonweed	UPL
Erigeron canadensis	Canadian horseweed	FACU
Erodium botrys	Broad-leaf filaree	FACU
Erodium cicutarium	Red-stem filaree	UPL
Eschscholzia californica	California poppy	UPL
Festuca perennis	Italian ryegrass	FAC
Galium aparine	Goose grass	FACU
Geranium dissectum	Cut-leaf geranium	UPL
Geranium molle	Dove's-foot geranium	UPL
Hirschfeldia incana	Short-podded mustard	UPL
Hordeum jubatum	Foxtail barley	UPL
Hordeum marinum subsp. gussoneanum	Mediterranean barley	FAC
Hordeum murinum	Wall barley	FACU
Hypericum perforatum subsp. perforatum	Klamathweed	FACU
Hypochaeris glabra	Smooth cat's-ear	UPL
Juncus mexicanus	Mexican rush	FACW
Juncus xiphioides	Iris-leaved rush	OBL

Lactuca serriola	Prickly lettuce	FACU
Lamium amplexicaule	Deadnettle	UPL
Lupinus bicolor	Miniature lupine	UPL
Lythrum hyssopifolia	Hyssop loosestrife	OBL
Melilotus sp.	Melilotus	UPL
Nasturtium officinale	Watercress	OBL
Olea europaea	Olive	UPL
Paspalum dilatatum	Dallis grass	FAC
Pinus sabiniana	Gray pine	UPL
Plantago lanceolata	English plantain	FAC
Polypogon monspeliensis	Annual beard grass	FACW
Populus fremontii subsp. fremontii	Fremont cottonwood	FAC
Prunus dulcis	Almond tree	UPL
Pyracantha sp.	Pyracantha	UPL
Pyrus sp.	Pear	UPL
Quercus douglasii	Blue oak	UPL
Quercus lobata	Valley oak	FACU
Quercus wislizeni	Interior live oak	UPL
Rubus armeniacus	Himalayan blackberry	FACU
Rumex crispus	Curly dock	FAC
Salix exigua var. exigua	Narrowleaf willow	FACW
Salix lasiolepis	Arroyo willow	FACW
Silybum marianum	Milk thistle	UPL
Sonchus asper subsp. asper	Prickly sow-thistle	FAC
Spartium junceum	Spanish broom	UPL
Torilis arvensis	Field hedgeparsley	UPL
Toxicodendron diversilobum	Western poison-oak	FACU
Trifolium hirtum	Rose clover	UPL
Verbascum blattaria	Moth mullein	UPL
Verbascum thapsus	Woolly mullein	FACU
Veronica sp.	Speedwell	VARIES
Vicia sativa	Common vetch	FACU
Vicia villosa	Winter vetch	UPL
Vinca major	Periwinkle	UPL

Sources: Salix Consulting, Inc. 2016and HBG field observations between March and June of 2017.

TABLE 2. ANIMAL SPECIES OBSERVED ON THE PROJECT SITE OR EXPECTED TO UTILIZE THE PROJECT SITE

MAMMALS

Virginia Opossum	*Didelphis virginiana*
Broad-footed Mole	*Scapanus latimanus*
California Myotis	*Myotis californicus*
Yuma Myotis	*Myotis yumanensis*
Western Pipistrelle	*Pipistrellus hesperus*
Big Brown Bat	*Eptesicus fuscus*
Hoary Bat	*Lasiurus cinereus*
Red Bat	*Lasiurus borealis*
Pallid Bat	*Antrozous pallidus*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Black-tailed Hare	*Lepus californicus*
Desert Cottontail	*Sylvilagus audubonii*
California Ground Squirrel	*Spermophilus beecheyi*
Botta's Pocket Gopher	*Thomomys bottae*
Western Harvest Mouse	*Reithrodontomys megalotis*
Deer Mouse	*Peromyscus maniculatus*
Dusky-footed Woodrat	*Neotoma fuscipes*
California Vole	*Microtus californicus*
Black Rat	*Rattus rattus*
Norway Rat	*Rattus norvegicus*
House Mouse	*Mus musculus*
Coyote	*Canis latrans*
Gray Fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Long-tailed Weasel	*Mustela frenata*
Striped Skunk	*Mephitis mephitis*
Mule Deer	*Odocoileus hemionus*

REPTILES AND AMPHIBIANS

Pacific Treefrog	*Pseudacris regilla*
Western Toad	*Bufo boreas*
Western Fence Lizard	*Sceloporus occidentalis*
Coast Horned Lizard	*Phrynosoma coronatum*
Western Skink	*Eumeces skiltonianus*
Gilbert’s Skink	*Eumeces gilberti*
Western Whiptail	*Cnemidophorus tigris*
Southern Alligator Lizard	*Gerrhonotus multicarinatus*

Ringneck Snake	*Diadophis punctatus*
Sharp-tailed Snake	*Contia tenuis*
Racer	*Coluber constrictor*
California Whipsnake	*Masticophis lateralis*
Coachwhip	*Masticophis flagellum*
Gopher Snake	*Pituophis melanoleucus*
Common Kingsnake	*Lampropeltis getulus*
Common Garter Snake	*Thamnophis sirtalis*
Western Terrestrial Garter Snake	*Thamnophis elegans*
Night Snake	*Hupsiglena torquata*
Western Rattlesnake	*Crotalis viridis*

BIRDS

Turkey Vulture	*Cathartes aura*
White-tailed Kite	*Elanus caeruleus*
Northern Harrier	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperi*
Red-tailed Hawk	*Buteo jamaicensis*
Red-shouldered Hawk	*Buteo lineatus*
Golden Eagle	*Aquila chrysaetos*
Bald Eagle	*Haliaeetus leucocephalus*
American Kestrel	*Falco sparverius*
Prairie Falcon	*Falco mexicanus*
Peregrine Falcon	*Falco peregrinus*
Merlin	*Falco columbarius*
California Quail	*Callipepla californica*
Killdeer	*Charadrius vociferous*
Wilson’s Snipe	*Gallinago delicata*
Ring-billed Gull	*Larus delawarensis*
California Gull	*Larus californicus*
Herring Gull	*Larus argentatus*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Barn Owl	*Tyto alba*
Great Horned Owl	*Bubo virginianus*
Western Screech-Owl	*Otus kennicottii*
Vaux’s Swift	*Chaetura vauxi*
Anna's Hummingbird	*Calypte annas*
Northern Flicker	*Colaptes auratus*
Acorn Woodpecker	*Melanerpes formicivorus*
Lewis’s Woodpecker	*Melanerpes lewis*
Red-breasted Sapsucker	*Sphyrapicus ruber*

Nuttall’s Woodpecker	*Picoides nuttallii*
Downy Woodpecker	*Dendrocopos pubescens*
Black Phoebe	*Sayornis nigricans*
Say's Phoebe	*Sayornis saya*
Pacific-slope Flycatcher	*Empidonax difficilus*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Western Kingbird	*Tyrannus verticalis*
Barn Swallow	*Hirundo rustica*
Cliff Swallow	*Petrochelidon pyrrhonota*
Tree Swallow	*Tachicineta bicolor*
Violet-green swallow	*Tachycineta thalassina*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
California Scrub-jay	*Aphelocoma californica*
American Crow	*Corvus brachyrhynchos*
Common Bushtit	*Psaltriparus minimus*
Oak Titmouse	*Parus inornatus*
White-breasted Nuthatch	*Sitta carolinensis*
Bewick's Wren	*Thryomanes bewickii*
House Wren	*Troglodytes aedon*
American Robin	*Turdus migratorius*
Hermit Thrush	*Hylocichla guttata*
Western Bluebird	*Sialia mexicana*
Ruby-crowned Kinglet	*Regulus calendula*
Northern Mockingbird	*Mimus polyglottos*
Cedar Waxwing	*Bombycilla cedrorum*
Loggerhead Shrike	*Lanius ludovicianus*
Hutton’s Vireo	*Vireo huttonni*
Orange-crowned Warbler	*Orethlypis celata*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaha coronata*
Townsend's Warbler	*Setophaga townsendi*
Common Yellowthroat	*Geothlypis trichas*
Western Tanager	*Piranga ludoviciana*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Lazuli Bunting	*Passerina amoena*
Spotted Towhee	*Pipilo maculatus*
California Towhee	*Pipilo crissalis*
Savannah Sparrow	*Passerculus sandwichensis*
Lark Sparrow	*Chondestes grammacus*
White-crowned Sparrow	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia maxillaris*
Lincoln's Sparrow	*Melospiza lincolnii*

Dark-eyed Junco	*Junco hyemalis*
Western Meadowlark	*Sturnella neglecta*
Red-winged Blackbird	*Agelaius phoeniceus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown-headed Cowbird	*Molothrus ater*
Bullock's Oriole	*Icterus bullockii*
Purple Finch	*Haemorhous purpureus*
House Finch	*Carpodacus mexicanus*
Pine Siskin	*Spinus pinus*
American Goldfinch	*Spinus tristis*
Lesser Goldfinch	*Spinus psaltria*
House Sparrow	*Passer domesticus*

Mayer and Laudenslayer (1988)
National Geographic Society (2011)
Reid (2006)
Sibley (2014)
Stebbins (2003)
Zeiner et al. (1990a, 1990b, 1990c)

TABLE 3. SPECIAL STATUS PLANTS KNOWN TO OCCUR IN THE VICINITY OF THE PROJECT AREA, PLACER COUNTY, CALIFORNIA [1]

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Big-scale (California) balsamroot (*Balsamorhiza macrolepis var. macrolepis*)	--/--/1B.2	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite; 90-1400m.	Not present. No individuals of this species were found during protocol surveys conducted in spring/summer 2017.
Stebbins morning-glory *(Calystegia stebbinsii)*	FE/CE/1B1	Found in chaparral, cismontane woodland. Occurs on red clay soils of the pine-hill formation, on gabbro or serpentine. Prefers open areas. 300-725 M.	Not present. Suitable habitat not present at the site.
Pine Hill ceanothus (*Ceanothus roderickii*)	FE/Rare/1B.2	Found in chaparral and cismontane woodland. In gabbroic soils, often in disturbed area with other rare plants. 260-630 m.	Not present. Suitable habitat not present at the site.
Brandegee's clarkia (*Clarkia biloba* ssp. *brandegeeae*)	--/--/4.2	Found in chaparral, cismontane woodland, and lower montane coniferous forest. Often in roadcuts. 75-915 m.	Not present. No individuals of this species were found during protocol surveys conducted in spring/summer 2017.
Red Hill soaproot (*Chlorogalum grandiflorum*)	--/--/1B.2	Found in cismontane woodland, chaparral, and lower montane coniferous forest. Occurs frequently on serpentine or gabbro, but also on non-ultramafic substrates and often on disturbed sites. 240-760 m.	Not present. Suitable habitat not present at the site.
Hispid salty bird's beak *(Chloropyron molle ssp. hispidum)*	--/--1B/1	Found in damp alkaline soils in meadows, seeps, playas, valley and foothill grassland. Especially in alkaline meadows and alkali sins with *Distichlis*. 1-155 M.	Not present. Suitable habitat not present at the site.
Dwarf downingia (*Downingia pusilla*)	--/--/2B.2	Found vernal pools and mesic sites within valley and foothill grassland. Found along margins of several types of vernal pools. 1-445 m.	Not present. Suitable habitat not present at the site.

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Stinkbells (*Fritillaria agrestis*)	--/--/4.2	Found in cismontane woodland, chaparral, and valley and foothill grassland. Sometimes found on serpentine, mostly found in non-native grassland or in grassy openings in clay soil. 10-1555 m.	Not present. No individuals of this species were found during protocol surveys conducted in spring/summer 2017.
El Dorado bedstraw (*Galium californicum ssp. sierra)*	FE/Rare/1B.2	Found in cismontane woodland, chaparral, and lower montane coniferous forest. Occurs in pine-oak woodland or chaparral. Restricted to gabbroic or serpentine soils. 130-585 M.	Not present. Suitable habitat not present at the site.
Bogg's Lake hedge hyssop (*Gratiola heterosepala*)	--/CE/1B.2	Inhabits vernal pools and freshwater swamps and marshes. In clay soils and usually in vernal pools, sometime on lake margins. 10-2375 m.	Not present. Suitable habitat not present at the site.
Bisbee Peak rush-rose (*Helianthemum suffrutescens*)	--/--/3.2	Found in openings in chaparral, often on serpentine, gabbroic, or Ione formation soils. 45-840 m.	Not present. Suitable habitat not present at the site.
Ahart's dwarf rush (Juncus leiospermus var. ahartii)	--/--/ 1B.2	Restricted to the edge of vernal pools. Vernal pools and grasslands. 30-229 m.	Not present. Suitable habitat not present at the site.
Red Bluff dwarf rush *(Juncus leiospermus var. leiospermus)*	--/--/1B.1	Found in vernally mesic sites, sometimes on edges of vernal pools within chaparral, valley and foothill grassland, cismontane woodland, vernal pools, meadows and seeps. 30-1025 M.	Not present. Suitable habitat not present at the site.
Legenere (*Legenere limosa*)	--/--/1B.1	Found in the beds of vernal pools. Many historical occurrences are extirpated. 1-880 m.	Not present. Suitable habitat not present at the site.
Pincushion navarretia (*Navarretia myersii* ssp. *myersii*)	--/--/1B.1	Found in vernal pools, in clay soils within non-native grassland. 20-330 m.	Not present. Suitable habitat not present at the site.
Sacramento Orcutt grass (*Orcuttia viscida*)	FE/CE/1B.1	Found in vernal pools. 30-100 m.	Not present. Suitable habitat not present at the site.

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Layne's ragwort (*Packera layneae*)	FT/Rare/1B.2	Found in ultramafic soil, occasionally along streams in chaparral and cismontane woodland. 200-1000 m.	Not present. Suitable habitat not present at the site.
Sanford's arrowhead (*Sagittaria sanfordii*)	--/--/1B.2	Found in marshes and swamps. In standing or slow-moving freshwater ponds, marshes and ditches. 0-650 m.	Not present. Suitable habitat not present at the site.
El Dorado County mule ears (*Wyethia reticulata*)	--/--/1B.2	Found in chaparral, cismontane woodland, and lower montane coniferous forest. Found in stony red clay and gabbroic soils, often in openings in gabbro chaparral. 185-630 m.	Not present. Suitable habitat not present at the site.

1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the Rocklin 7.5-Minute Quadrangle Map and surrounding areas, information dated February 2017.

2. Status Codes:

FE	Federal-listed Endangered
FT	Federal-listed Threatened
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
CE	California State-listed Endangered
CT	California State-listed Threatened
CR	California Rare
FP	California Fully Protected
CSC	California Species of Special Concern

California Rare Plant Rank 1A:	Plants presumed extirpated in California and either rare or extinct elsewhere.
California Rare Plant Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere.
California Rare Plant Rank 2A:	Plants presumed extirpated in California, but more common elsewhere.
California Rare Plant Rank 2B:	Plants rare, threatened, or endangered in California, but more numerous elsewhere.
California Rare Plant Rank 3:	Plants about which more information is needed – a review list.
California Rare Plant Rank 4:	Plants of limited distribution – a watch list.

CNPS Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

TABLE 4. SPECIAL STATUS ANIMAL SPECIES THAT HAVE BEEN REPORTED IN THE VICINITY OF THE PROJECT AREA, PLACER COUNTY, CALIFORNIA

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Invertebrates			
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	FT/--	Inhabits vernal pools; occurs throughout the Delta and Central Valley.	Not present. Suitable habitat is not present on site.
Vernal Pool Tadpole Shrimp (*Lepidurus packardi*)	FE/--	Inhabits vernal pools; known from scattered locations in the Delta and Central Valley.	Not present. Suitable habitat is not present on site.
California Linderiella (*Linderiella occidentalis*)	--/--	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	Not present. Suitable habitat is not present on site.
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	FT/--	Inhabits blue elderberry bushes (host plant); restricted to the Central Valley and adjacent foothills.	Not present. No elderberries were observed at the site during site surveys, therefor no potential habitat exists at the site for this species
Ricksecker's Water Scavenger Beetle (*Hydrochara ricksecker*i)	--/--	Aquatic beetle that lives in weedy shallow, open water associated freshwater seeps, springs, farm ponds, vernal pools (playa type pools) and slow-moving stream habitats.	Not present. Suitable habitat is not present on site.
Alabaster Cave harvestman *Banksula californica*	--/--	Known only from the type locality, Alabaster Cave in El Dorado County. The type locality has been partly destroyed by mining and the species may be extinct.	Not present. Suitable habitat is not present on site.

SCIENTIFIC NAME	STATUS[2]	HABITAT/RANGE	OCCURRENCE
Fish			
Conumnes stripetail *(Cosumnoperla hypocrena)*	--/--	Found in intermittent streams on the western slope of the Central Sierra Foothill in the American and Cosumnes River Basins.	Not present. Suitable habitat is not present on site.
Steelhead- Central Valley DPS *(Oncorhynchus mykiss irideus)*	FT/--	Population occur in the Sacramento and San Joaquin Rivers and their tributaries. In the project area found in Dry Creek and its tributaries in Secret Ravine and Miners Ravine.	Not present. Suitable habitat is not present onsite; no large river systems or suitable spawning streams. Suitable spawning habitat located about 4 miles southwest of the site in Secret Ravine and Miners Ravine. Best Management Practices are necessary to control contaminants in stormwater runoff.
Amphibians			
Western Spadefoot Toad (*Spea hammondii*)	--/CSC	Breeds in vernal pools/seasonal stock ponds in the Central Valley and southern coast.	Not likely. The site is in the range of the species. Habitat is less than optimal but marginally suitable. Preconstruction surveys are recommended.
California Red-legged Frog *(Rana draytonii)*	FT/CSC	Inhabits freshwater creeks and ponds in the scattered areas along the Coast Rangers from northern California down to northern Baja.	Not present. No CNDDB records in immediate vicinity of the property. The study site is considered to be outside of the current range of this species. Additionally, non-tidal wetlands onsite are seasonal and do not provide the perennial waters typically required for California Red-legged Frog.

Reptiles			
Western Pond Turtle *(Emys marmorata)*	--/CSC	Inhabits freshwater ponds and sluggish streams; occurs from WA to Baja, mostly west of the Sierra crest.	Not present. Suitable habitat is not present on site.
Birds			
Great Blue Heron (rookery site) *(Ardea herodias)*	--/--	Forms rookeries in large tree stands; occurs throughout California and elsewhere.	Rookery not present. Rookeries unlikely on the study site due to a lack of suitable trees.
Prairie Falcon *(Falco mexicanus)(*Nesting)	BCC/WL	Associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields and desert scrub. Permanent resident and migrant along inner coast and ranges.	Nesting unlikely. Appropriate nest sites not present. This species may forage on the site in winter, though none were observed in February 2017.
Peregrine Falcon *(Falco peregrinus anatum)(*Nesting)	Delisted,BCC /Delisted,FP	Inhabits open wetlands near cliffs, also occurs in some cities where nests on buildings and bridges.	Nesting unlikely. Appropriate nest sites not present.
Merlin *(Falco columbarius)* [wintering]	-/WL	Breeds in Canada, winters in a variety of California habitats, including grasslands, savannahs, wetlands, etc.	Wintering possible. The species may sporadically utilize the site as a winter foraging habitat.

Sharp-shinned Hawk *(Accipiter striatus)* [nesting]	-/WL	Breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers, but not restricted to, riparian habitats. North facing slopes, with plucking perches are critical requirements. All habitats except alpine, open prairie, and bare desert used in winter.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter. Preconstruction bird nesting surveys will include this species.
Cooper's Hawk *(Accipiter cooperii)* [nesting]	-/WL	Nests primarily in deciduous riparian forests; forages in open woodlands.	Nesting unlikely. Appropriate nesting habitat not present on site. Species likely forages on or near the site, especially in winter. Preconstruction bird nesting surveys will include this species.
Osprey (*Pandion haliaetus*) [Nesting]	--/WL	Breeds in northern California from the Cascade Ranges south to Lake Tahoe, and along the coast south to Marin County. Associated strictly with large, fish-bearing waters, primarily in Ponderosa pine through mixed conifer habitats.	Nesting unlikely. Suitable nesting habitat not present on site.
Ferruginous Hawk *(Buteo regalis)* (wintering)	BCC/CSC	Inhabits open country. Winters in small numbers along California coast and inland valleys.	Wintering possible. The site is considered suitable wintering foraging habitat, though none were observed in February 2017 field studies.
Swainson's Hawk (nesting) *(Buteo swainsoni)*	BCC/CT	Nests in trees and riparian stands; summer migrant to Central Valley. Suitable foraging areas include grasslands, pastures, alfalfa and other hay crops, and certain grain and row croplands.	Nesting unlikely. CNDDB records indicate this species nests within seven miles of the site. Nests unlikely on the property. The site may provide marginally suitable foraging habitat for this species, and one was observed flying over the site on April 22, 2017. Preconstruction bird nesting surveys will include this species.

Northern Harrier *(Circus cyaneus)* (nesting)	--/CSC	Forages and nests in grasslands, marshes, and agricultural fields; occurs throughout California, concentrated in the Central Valley and coastal valleys.	Nesting unlikely. Suitable nesting habitat not present on site. Preconstruction bird nesting surveys will include this species.
White-tailed Kite *(Elanus leucurus)* (nesting)	--/FP	Nests in dense oaks, willows, other trees; occurs in the Central Valley and adjacent low foothills.	Nesting unlikely. No CNDDB nesting records in vicinity. Nests unlikely on the study site due to a lack of suitable trees. Preconstruction bird nesting surveys will include this species.
Bald Eagle *(Haliaeetus leucocephalus)* (nesting and wintering)	Delisted,BCC /CE,FP	In winter, maybe be found throughout most of California at lakes, reservoirs, rivers and some rangelands and coastal wetlands. California's breeding habitats are mainly located in mountains and foothill forests near permanent water sources.	Nesting unlikely. Suitable nesting habitat not present on site.
Golden Eagle *(Aquila chrysaetos)* [nesting and wintering]	BCC/WL,FP	Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert.	Wintering possible. The site likely receives sporadic use by the species in winter.
California black rail *(Laterallus jamaicensis coturniculus)*	--/CT,FP	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt marsh with dense growths of pickleweed; also occurs in freshwater and brackish marshes.	Not present. Suitable habitat is not present at the site.
Short-eared Owl (nest site) *(Asio flammeus)*	--/CSC	Forages and nests in perennial marsh and grassland habitat; occurs in the Central Valley, coast, and east Sierra regions.	Nesting unlikely. Suitable nesting habitat not present on site.

Western Burrowing Owl *(Athene cunicularia hypugea)* (burrow sites)	BCC/CSC	Nests in mammal burrows, rock cavities in grassland and scrub; occurs throughout much of mid and lower California.	Not present. Although CNDDB documents nesting records in the project, suitable habitat is not present at the site due to tall heights of upland grasses and general lack of California ground squirrels and ground squirrel burrows. No individuals were observed during surveys in February or late April of 2017. Preconstruction bird nesting surveys will include this species.
Purple Martin *(Progne subis)*	--/CSC	Uses a variety of wooded, low-elevation habitats throughout California. Uses hardwood and hardwood-conifer habitats as well as riparian habitats. Now a rare and local breeder on the coast and in interior mountain ranges.	Nesting unlikely. Suitable nesting habitat not present on site.
Loggerhead Shrike *(Lanius ludovicianus)* (nesting)	BCC/CSC	Habitat includes open areas such as desert, grasslands, and savannah. Nests in thickly foliaged trees or tall shrubs. Forages in open habitat which contains trees, fence posts, utility poles and other perches.	Unlikely. Although not recorded for the project area in the CNDDB, trees and shrubs provide suitable nesting habitat. Not observed during surveys conducted in February or April of 2017. Preconstruction bird nesting surveys will include this species.
Grasshopper Sparrow *(Ammodramus savannarum)*	--/CSC	Found in dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches.	Nesting unlikely. Suitable nesting habitat not present on site.
Yellow Warbler *(Setophaha petechia)* [nesting]	BCC/CSC	Breeds in deciduous riparian woodlands, widespread during fall migration.	Nesting not present. May occur on site during fall migration, but suitable nesting habitat is not present at the site.
Tricolored Blackbird *(Agelaius tricolor)* (nesting colony)	BCC/CE, CSC	Nests in cattails, riparian scrub, and other dense marsh vegetation; occurs in SF Bay, Delta, and Central Valley basin.	Nesting not present. Appropriate nest sites not present. Preconstruction bird nesting surveys will include this species.

Mammals			
Silver-haired bat *(Lasionycteris noctivagans)*	--/--	Coastal and montane forests. Feeds over streams, ponds and open bushy areas, roosts in hollow trees.	Not present. Suitable habitat is not present at the site.
Pallid bat *(Antrozous pallidus)*	-/CSC	Roosts primarily in oak woodland and ponderosa pine habitats; forages in open areas.	Not present. Suitable habitat is not present at the site.
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	--/CCT,CSC	Found in desert scrub and coniferous forests. Roost in caves or abandoned mines and occasionally are found to roost in buildings.	Not present. Suitable habitat is not present at the site.
American badger *(Taxidea taxus)*	-/CSC	Drier open stages of most shrub, forest, and herbaceous habitats; needs sufficient food, friable soils and open, uncultivated ground.	Not present. Suitable habitat is not present at the site.

1. Source: California Natural Diversity Data Base, Natural Heritage Division, California Department of Fish and Wildlife for the Rocklin 7.5-Minute Quadrangle Map and surrounding areas, information dated February 2017.

2. Status Codes:

FE Federal-listed Endangered
FT Federal-listed Threatened
FPE Federally Proposed Endangered
FPT Federally Proposed Threatened
BCC USFWS Bird Species of Conservation Concern

CE California State-listed Endangered
CT California State-listed Threatened
CR California Rare
FP California Fully Protected
CSC CDFW Species of Special Concern
WL CDFW Watch List Species

ATTACHMENT 3

Wetland Delineation for the 17.88 Sierra-Brace Study Area, Town of Loomis, Placer County, California, prepared by Salix Consulting, Inc. May 2016.

WETLAND DELINEATION
FOR THE

±17.88-ACRE SIERRA-BRACE STUDY AREA

TOWN OF LOOMIS, PLACER COUNTY, CALIFORNIA

Prepared for:

MANIKAS PROPERTIES
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Prepared by:

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MAY 2016

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Attachment 1. USACOE Verification letter dated March 2009

WETLAND DELINEATION
FOR THE
±17.88-ACRE SIERRA-BRACE STUDY AREA

INTRODUCTION

On behalf of Manikas Properties, Salix Consulting, Inc., is submitting this updated delineation of waters of the United States for the ±17.88-acre Sierra-Brace study area in the Town of Loomis, Placer County, California. The property was originally delineated by North Fork Associates in February 2008 and verified by the Corps March 20, 2009 (SPK-2008-00630). This document largely includes the original delineation documentation and mapping, with minor adjustments, as needed.

The study area is located north of Interstate 80, in the southeastern corner of the intersection between Sierra College Boulevard and Brace Road. The location corresponds to Section 28 of Township 11 North and Range 7 East on the 7.5 minute Rocklin, CA United States Geological Survey (USGS) quadrangle (Figure 1). The latitude and longitude of the approximate center of the site are 38°48'34"North and 121°12'16" West. The Assessor Parcel Numbers (APNs) are 045-042-011, 045-042-012, 045-042-023, 045-042-034, 045-042-035, 045-042-036, and 045-042-037.

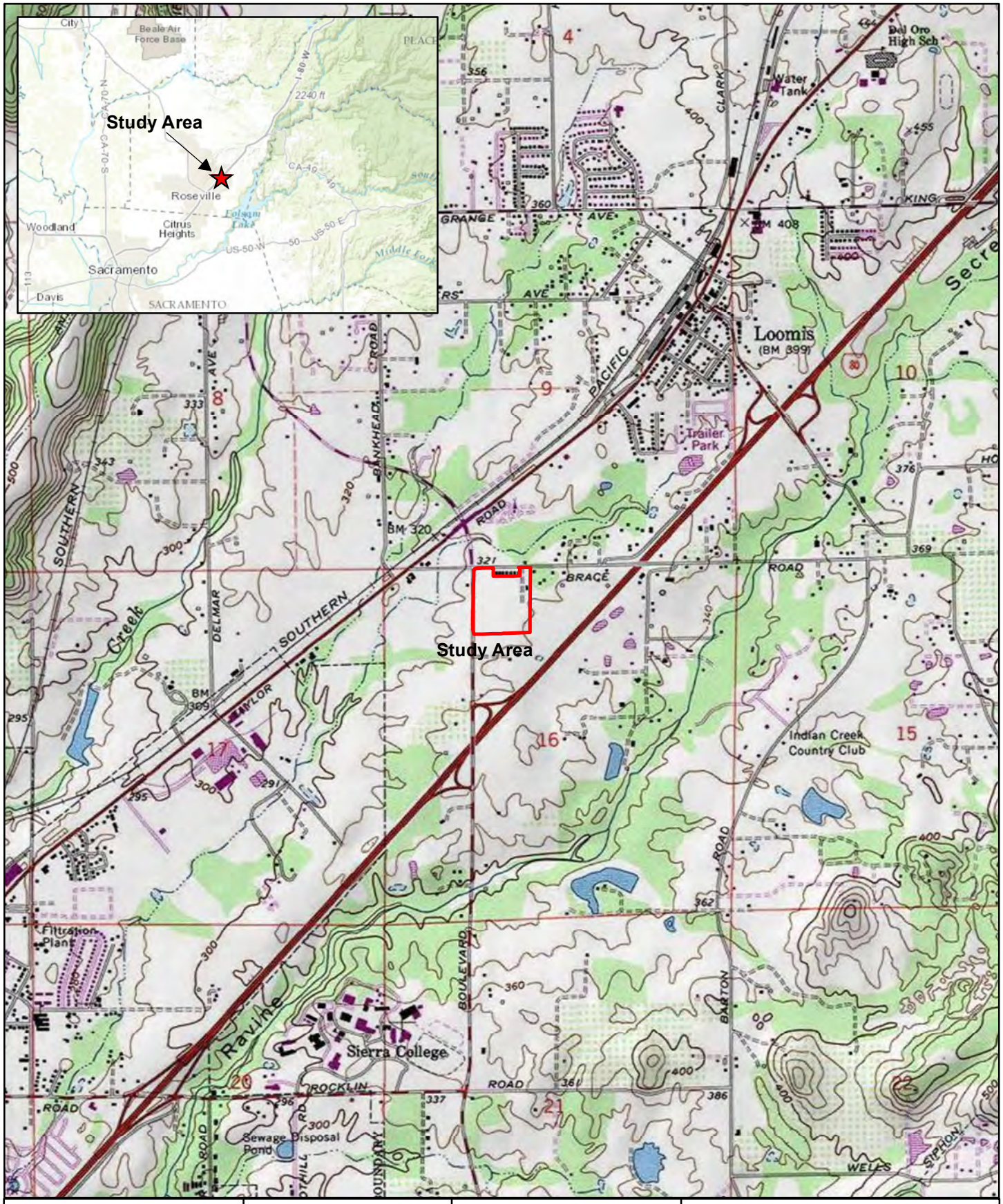
The study area is located at an elevation between approximately 320 and 340 feet. Habitats in the study area include annual grassland and foothill woodland. Adjacent land uses include a multi-family residential building along the northern boundary the Homewood Lumber complex to the north, single family residential to the east, commercial and undeveloped land to the south, and an office building and undeveloped land to the west (Figure 2). The study area is bounded by Brace Road to the north and Sierra College Boulevard to the west.

Background

As noted above, waters of the U.S. were delineated by North Fork Associates in February 2008 and verified by the U.S. Army Corps of Engineers March 20, 2009. The verification was valid for five years from the date of the letter. The 2009 verification letter is included as Attachment 1, following the Appendices. Property ownership has changed since that time, and this report is intended to update that delineation.

Directions to the Site

From Sacramento, proceed east on Interstate 80. Take the Sierra College Boulevard exit and turn left after exiting the freeway. The Brace Road and Sierra College Boulevard intersection is just north of Interstate 80. The study area is located in the southeastern corner of the intersection.



Salix consulting, inc.

N

0 1,000 2,000

Feet

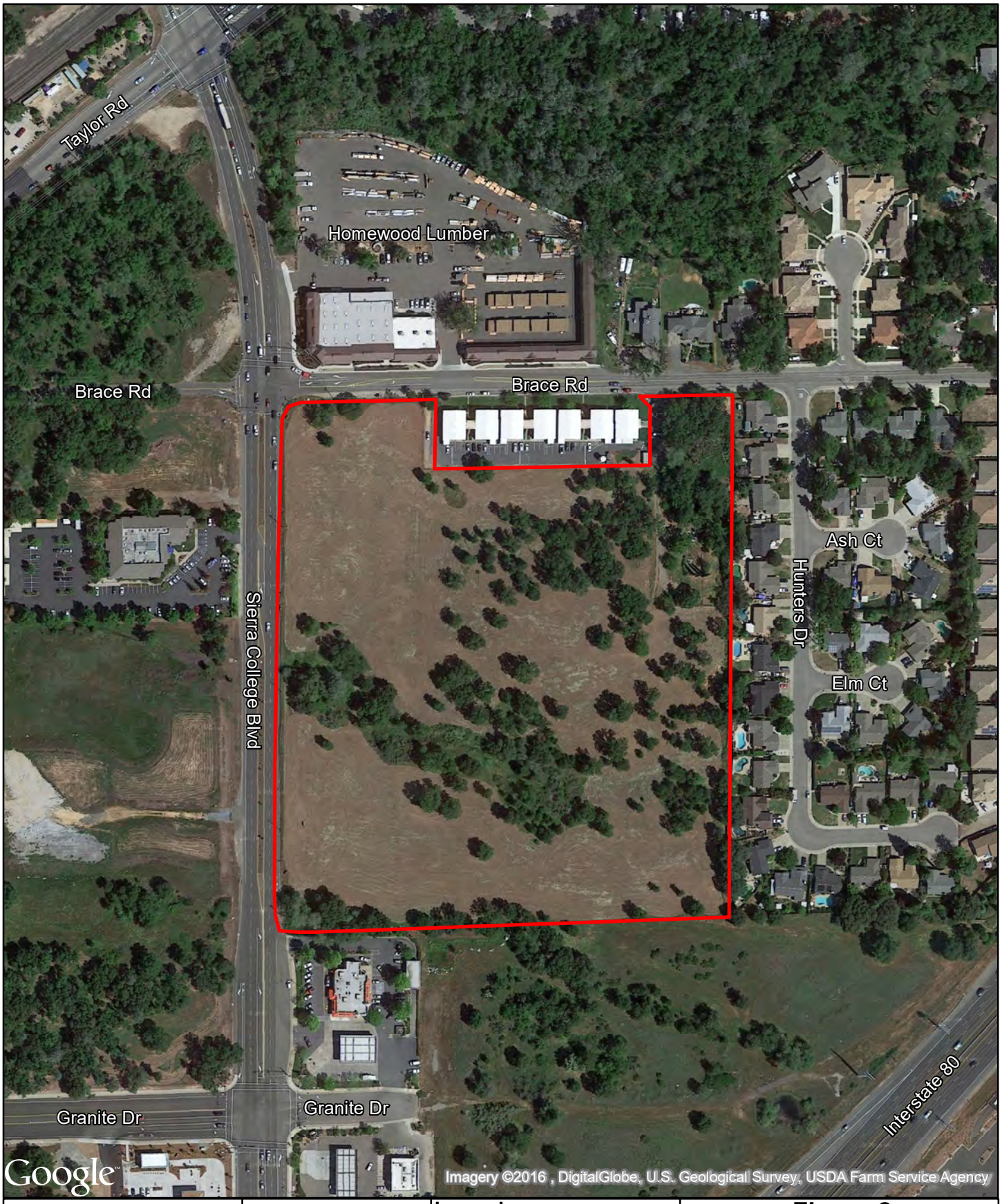
Source Maps: USGS Topographic Map
Rocklin Quad 1:24,000
Section: 16
Township: 11N
Range: 7E

Figure 1

SITE AND VICINITY MAP

Sierra-Brace

City of Rocklin, Placer County, CA



Salix consulting, inc.

N

0 125 250

Feet

Legend

Study Area (±18.27 acres)

Figure 2

AERIAL MAP

Sierra-Brace

City of Rocklin, Placer County, CA

CONTACT INFORMATION

Property Owner:
Manikas Properties
1817 Maryal Drive, Suite 100
Sacramento, CA 95864
(916) 847-5090
Contact: John T. Manikas

Delineator:
Salix Consulting, Inc.
12240 Herdal Drive, Ste. 14
Auburn, California 95603
Phone: (530) 888-0130
Contact: Jeff Glazner

METHODS

Waters of the United States were assessed on March 25, 2016, by Jeff Glazner and Hunter Gallant. The North Fork delineation was uploaded to the submeter GPS and field checked. Very minor adjustments were made and are reflected in the map provided in this document. The original topographic basemap was used for the revised map as new topo was not available. The original data forms are included in Appendix A. The plant list for the site is included as Appendix B.

RESULTS

Climate

The region has a Mediterranean climate with dry hot summers and mild winters. Over the course of a year, average high temperatures typically vary from 54°F in the winter to around 92°F in the summer. The warm season lasts from May through September, with an average daily high temperature above 88°F. On average, the hottest months are July and August with an average high of 92°F and low of 61°F. The coolest months are December and January, with an average daily high temperature around 54°F and average low temperature around 40°F. Precipitation occurs mostly from November through April in the form of rain, averaging around 25 inches per year. Little or no precipitation falls during June, July, and August.

Precipitation occurred 3 days prior to the March 25, 2016, field visit, amounting to one-half an inch of rainfall.

Soils

One soil unit is mapped in the study area (Figure 3): Andregg coarse sandy loam, 2 to 9 percent slopes.

Andregg soils on-site are coarse-loamy Ultic Haploxerolls, which are Mollisols formed in a Mediterranean climate and characterized by little subsoil development. This component is on foothills, hills with slopes of 2 to 9 percent. They are derived from weathered granodiorite, and bedrock is 29 to 33 inches below the surface. The A horizon extends to about 15 inches and the BA horizon to about 24 inches. Hues range from 10YR to 2.5YR; values between 5 and 2; and chromas between 3 and 2, moist. Organic matter at the surface horizon is around 2 percent. Andregg soils are well-

Salix consulting, inc.

N

0 100 200

Feet

Legend

Study Area (±18.27 acres)

Figure 3

SOIL COMPONENTS MAP

Sierra-Brace

City of Rocklin, Placer County, CA

drained and have moderately rapid permeability. This soil is neither ponded nor flooded. This soil does not meet hydric criteria.

Hydrology

The Sierra-Brace study area is located in the Lower American watershed (Hydrologic Unit Code 18020111). The topography of the study area gently slopes to the west. The wetland swale and drainage ditch located in the southwest corner of the site drain water westerly and convey water offsite through culverts underneath Sierra College Boulevard. Water continues to drain westerly on the adjacent property and drains into Sucker Ravine which drains into Secret Ravine. Secret Ravine is a tributary of Miners Ravine, which ultimately reaches Dry Creek and then the American River. The constructed drainage in the northeastern corner conveys storm water and urban runoff from the residential development to the east through a storm drain system.

Vegetation

Two biological communities were identified within the study area: foothill woodland and annual grassland. The site wetlands are embedded in these habitats. Figures 4a and 4b. provides photos of the site taken during the March 25, 2016, site visit.

Foothill Woodland

The foothill woodland varies in density throughout the site, being mostly open, and it is dominated by valley oak and interior live oak with a few scattered foothill pines. Shrubs in the understory vary from dense stands of coyote brush and Himalayan blackberry to a completely absent shrub layer. The herbaceous layer consists of a mixture of non-native grasses and forbs. Grasses include Italian ryegrass, ripgut grass, and soft chess. Forbs present include Italian thistle, California mugwort, field hedge-parsley, klamathweed, broad leaf filaree, common vetch, and crane's-bill geranium.

The wetland swale in the study area occurs within the foothill woodland habitat. A few Fremont cottonwood, narrow-leaved willow, and arroyo willow occur within the shrub understory. The herbaceous understory includes curly dock, Mexican rush, Iris-leaf rush, tall flatsedge, and prickly lettuce.

Annual Grassland

The non-native grasses and forbs that occur in the foothill woodland also occur in the annual grassland in the study area. Other grasses and forbs present in the annual grassland include wild oat, hedgehog dogtail, foxtail barley, medusahead, yellow star-thistle, rose clover, smooth's cat-ear, common fiddleneck, short-podded mustard, and bindweed. The annual grassland onsite appears to be disked annually.

1. Culvert carrying flows to the west from WS-1 under Sierra College Boulevard. *Photo date: 3-25-16*

2. Looking upslope along WS-1. *Photo date: 3-25-16*

Salix consulting, inc.

Figure 4a

SITE PHOTOS

Sierra-Brace

City of Rocklin, Placer County, CA

1. Looking at southwest corner of property at culvert carrying flows of WS-3 to the west under Sierra College Blvd. *Photo date: 3-25-16*

2. Looking west over outfall of WS-2.
Photo date: 3-25-16

Salix consulting, inc.

Figure 4b

SITE PHOTOS

Sierra-Brace

City of Rocklin, Placer County, CA

Waters of the United States

One category of waters of the United States was mapped on the site: wetland swale. Table 1 provides an acreage summary of the wetland swales. The wetland delineation map is included in Figure 5. GIS data is provided on the accompanying DVD, and the Corps of Engineers Aquatic Resources spreadsheet is included as Appendix C.

Table 1.
Waters of the United States within the Sierra-Brace Study Area

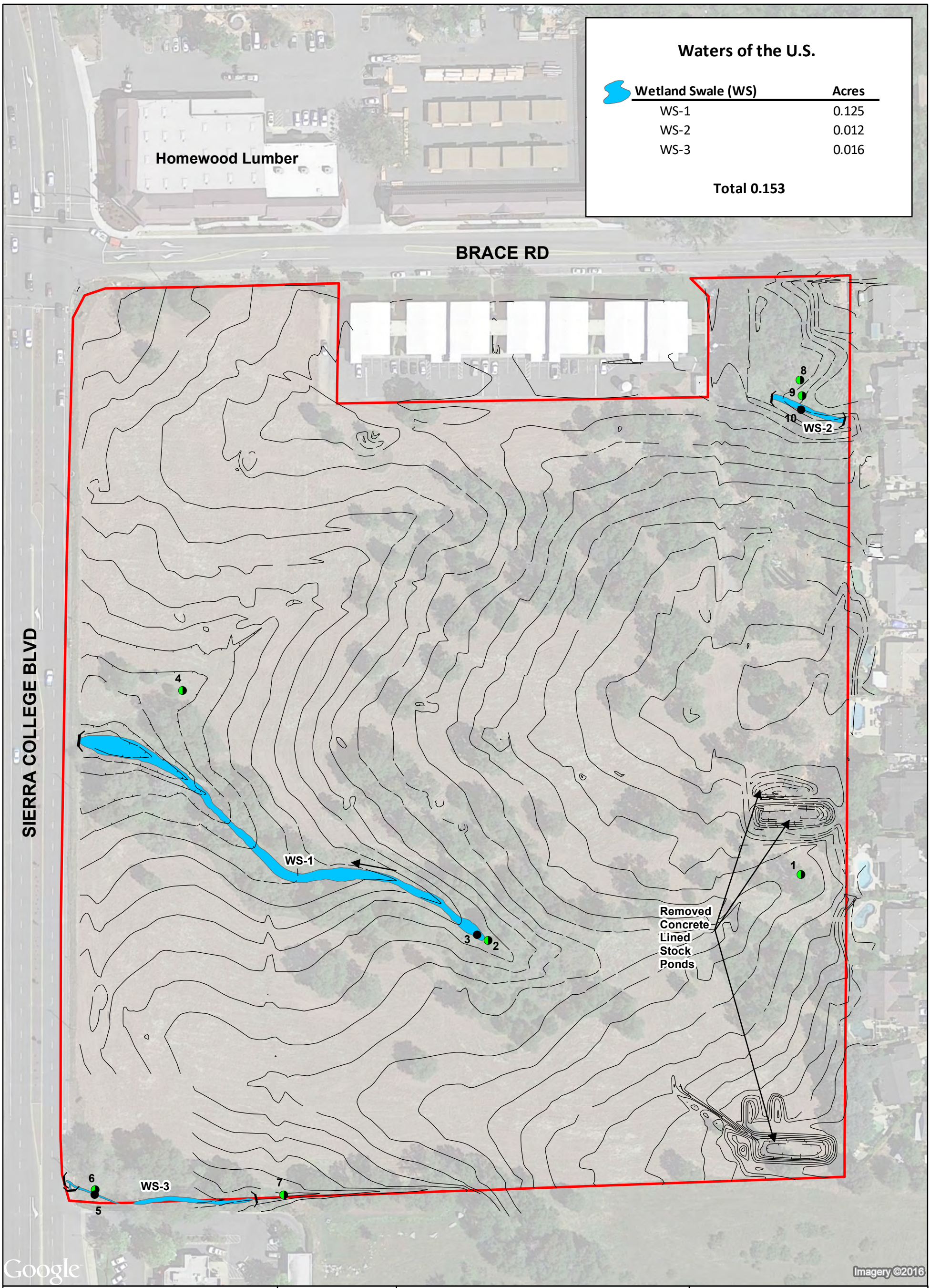
Type	Acreage
Wetlands:	
Wetland swale	
WS-1	0.125
WS-2	0.012
WS-3	0.016
Total Waters of the United States	**0.153**

Wetland Swale

One wetland swale occurs within the foothill woodland habitat (Figure 4a). This swale (WS-1) begins in the middle of the study area, where it collects surface water (in the form of sheet flow) and then drains westerly, where it then exits the study area through a culvert underneath Sierra College Boulevard. The beginning of the swale is a small open area dominated by iris leaf rush. The swale then continues west through a dense patch of coyote brush and opens up again near the culvert adjacent to Sierra College Boulevard. Wetland plant species such as hyssop loosestrife, curly dock, prickly lettuce, Italian ryegrass, and Mexican rush are present within the lower portion of the swale.

A second wetland swale (WS-2) enters the study area through a culvert along the eastern boundary in the northeast corner of the study area. The swale appears to convey stormwater runoff and urban water westerly for approximately 80 feet within the study area, and then exits the study area through a culvert underneath Starlight Lane. The swale is densely vegetated with Himalayan blackberry (Figure 4b).

A third swale (WS-3) occurs in the southwestern corner of the study area, where stormwater runoff drains onto the study area through an 18-inch PVC culvert located on the commercial development (McDonald's/Chevron) to the south. Wetland species such as water plantain, veronica, moth mullein, water cress, and curly dock are present. The swale (WS-3) continues for approximately 175 feet west until it merges with a narrower excavated ditch that drains water from a 12-inch concrete culvert located under the commercial development to the south (Figure 4b). Water exits the study area along the western boundary through a 30-inch corrugated metal pipe culvert under Sierra College Boulevard.



Prepared By:

Salix consulting, inc.

Prepared For:
Manikas Properties
1817 Maryal Drive, Suite 100
Sacramento, CA 95864

N

0 50 100
Feet

USACE REGULATORY FILE#: SPK-2008-00630
DATE OF VERIFICATION: March 20, 2009

Legend

- Study Area (±18.20 acres)
- Culvert
- Wetland Data Point
- Upland Data Point

NOTES: Revised wetland delineation conducted March 2016. Original delineation conducted by Pat Britton and Barry Anderson of North Fork Associates in 2007.

Figure 5

WETLAND DELINEATION

Sierra-Brace

Town of Loomis, Placer County, CA

April 18, 2016

Former Cattle Watering Holes

According to historic information, three concrete-lined livestock ponds once existed onsite and these ponds had been directly connected to a well and pump that had been abandoned, and that they had been filled for safety reasons, utilizing a grading permit issued by the Town of Loomis (#5475). Because we are using the old topographic mapping, the concrete depressions appear on the map. These areas are now leveled ground.

REFERENCES AND OTHER SOURCES

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National Oceanic & Atmospheric Administration (NOAA) 2016. Record of Climatological Observation, Month of March 2016. https://www.ncdc.noaa.gov/cdo-web/Accessed April 25, 2016.

Appendix A.
Wetland Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 1
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus lobata*	30	☒	FAC
2.		☐	
3.		☐	
4.		☐	
Total Cover:	30		
Sapling/Shrub Stratum			
1.. *Rubus discolor*	5	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	5	☐	
Herb Stratum			
1. *Lolium multiflorum*	40	☒	FAC
2. *Unknown grass*	20	☒	FAC
3. *Rumex crispus*	10	☐	FACW-
4. *Vicia sativa*	5	☐	FACU
5. *Galium aparine*	5	☐	FACU
6. *Geranium molle*	5	☐	-
7. *Cyperus eragrostis*	1	☐	FACW
8.		☐	
Total Cover:	86		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5 YR 4/2	100					Coarse sandy loam	
4-5	10 YR 4/2	100					Coarse sandy loam	
5-9	10 YR 3/1	90	7.5 YR 3/3	10	C	M	Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:
At 6 inches deep within the soil profile, there appears to be a red band.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):	
Water Table Present?	Yes ☐	No ☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches):	

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Lacks evidence of wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 2
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Upland comparison point to data point #3.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Bromus hordeaceus*	40	☒	FACU-
2. *Bromus diandrus*	40	☒	-
3. *Geranium molle*	15	☐	-
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	95		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5 YR 2/2	100					Coarse sandy loam	
2-14	10 YR 3/1	100					Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches):

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
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- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 3
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

Is the Sampled Area within a Wetland? **Yes** ☒ **No** ☐

Remarks:
Wetland swale.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Juncus xiphioides*	90	☒	OBL
2. *Geranium molle*	10	☐	-
3. *Rumex crispus*	5	☐	FACW-
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	105		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 2/2	100					Coarse sandy loam	
2-14	10 YR 4/1	100					Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Low chroma, soils are hydric based on the Corps 1987 Manual.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):		
Water Table Present?	Yes ☐	No ☐	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches):	17 in	**Wetland Hydrology Present Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 4
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Bromus hordeaceus*	30	☒	FACU-
2. *Hordeum murinum*	30	☒	-
3. *Trifolium hirtum*	20	☒	-
4. *Lolium multiflorum*	10	☐	FAC
5. *Geranium molle*	5	☐	-
6.		☐	
7.		☐	
8.		☐	
Total Cover:	95		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≥3.0[1]
- ☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:
Recently plowed.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/2	100					Coarse sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____ **Wetland Hydrology Present Yes** ☐ **No** ☒

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 5
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Ditch that drains storm water runoff. Drains for a short distance on the site and leaves via a 30 inch culvert under Sierra College Boulevard.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Juncus xiphioides*	20	☒	OBL
2. *Juncus mexicanus*	10	☒	FACW
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	30		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: 70 % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:
Recently cleared.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5 YR 2.5/1	100					Coarse sandy loam	
4-12	10 YR 4/1	90	7.5 YR 4/6	10	C	M	Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____ **Wetland Hydrology Present Yes** ☒ **No** ☐

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: State: CA Sampling Point: 6
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Upland comparison point to data point #5.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	20	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	20	☐	
Herb Stratum			
1. *Geranium molle*	15	☒	-
2. *Bromus hordeaceus*	10	☒	-
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:	25		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: 20 % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3
Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 3/2	100					Coarse sandy loam	
4-12	10 YR 3/2	98	10 YR 3/3	2	C	M	Loamy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____ **Wetland Hydrology Present Yes** ☐ **No** ☒

(includes capillary fringe)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/13/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 7
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5%
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:
Upland swale.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1..		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:		☐	
Herb Stratum			
1. *Bromus diandrus*	40	☒	-
2. *Bromus hordeaceus*	40	☒	FACU-
3. *Epilobium brachycarpum*	20	☐	-
4. *Veronica sp.*	10	☐	Varies
5. *Vicia sativa*	5	☐	FACU
6. *Torilis arvensis*	5	☐	-
7.		☐	
8.		☐	
Total Cover:	120		
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☐ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☐ No: ☒

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 3/2	100					Loam	
8-12	7.5 YR 4/2	100					Sandy	Sand mixed with soil, multi-colored

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/27/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 8
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): None Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	100	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	100	☐	
Herb Stratum			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:			
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 3/2	100					Loamy	
6-12	7.5 YR 3/2	50	10 YR 4/3	50			Coarse loam	Chunks of decomposed granite mixed in soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:
Soil profile may consist of mixed soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/27/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 9
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☐ No ☒
Wetland Hydrology Present? Yes ☐ No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	100	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	100	☐	
Herb Stratum			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:			
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/2	100					Coarse loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches):

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present Yes ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Lacks evidence of prolonged seasonal saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sierra-Brace City/County: Town of Loomis, Placer County Sampling Date: 12/27/2007
Applicant/Owner: Patterson Properties State: CA Sampling Point: 10
Investigator(s): Pat Britton and Melissa Perretti Section, Township, Range: Section 16, Township 11N, Range 7E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR): C Lat: 38°48'34"North Long: 121°12'16" West Datum: NAD 83
Soil Map Unit Name: Andregg coarse sandy loam, 2 to 9 percent slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐
Hydric Soil Present? Yes ☒ No ☐
Wetland Hydrology Present? Yes ☒ No ☐

Is the Sampled Area within a Wetland? **Yes** ☒ **No** ☐

Remarks:
Drainage ditch

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		☐	
2.		☐	
3.		☐	
4.		☐	
Total Cover:			
Sapling/Shrub Stratum			
1.. *Rubus discolor*	100	☒	FACW
2.		☐	
3.		☐	
4.		☐	
5.		☐	
Total Cover:	100	☐	
Herb Stratum			
1.		☐	
2.		☐	
3.		☐	
4.		☐	
5.		☐	
6.		☐	
7.		☐	
8.		☐	
Total Cover:			
Woody Vine Stratum			
1.		☐	
2.		☐	
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
☒ Dominance Test is >50%
☐ Prevalence Index is ≥3.0[1]
☐ Morphological Adaptations[1] (Provides supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes: ☒ No: ☐

Remarks:
Rubus over ditch/stream.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 3/1	100					Sandy loam	
4-12	2.5 Y 5/3	90	2.5 Y 5.5/1				Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☒	No ☐	Depth (inches):	1"
Water Table Present?	Yes ☐	No ☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches):	0

Wetland Hydrology Present Yes ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix B.
Wetland Status of Plant Species Observed in the Sierra-Brace Study Area

Appendix B. Wetland Status of Plant Species Observed

Taxon	Common Name	Wetland Status
Acacia baileyana	Cootamundra wattle	UPL
Acmispon americanus var. americanus	Spanish-clover	UPL
Alisma triviale	California water plantain	OBL
Amsinckia menziesii	Rancher's fireweed	UPL
Artemisia douglasiana	California mugwort	FAC
Arundo donax	Giant reed	FACW
Avena fatua	Wild oat	UPL
Baccharis pilularis	Coyote brush	UPL
Briza minor	Small quaking grass	FAC
Bromus diandrus	Ripgut grass	UPL
Bromus hordeaceus	Soft chess	FACU
Carduus pycnocephalus	Italian thistle	UPL
Centaurea solstitialis	Yellow starthistle	UPL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canada thistle	FACU
Clarkia sp.	Clarkia	UPL
Claytonia perfoliata	Common miner's lettuce	FAC
Convolvulus arvensis	Bindweed	UPL
Cynodon dactylon	Bermudagrass	FACU
Cynosurus echinatus	Hedgehog dogtail	UPL
Cyperus eragrostis	Tall flatsedge	FACW
Cytisus scoparius	Scotch broom	UPL
Elymus caput-medusae	Medusahead	UPL
Epilobium brachycarpum	Summer cottonweed	UPL
Erigeron canadensis	Canadian horseweed	FACU
Erodium botrys	Broad-leaf filaree	FACU
Erodium cicutarium	Red-stem filaree	UPL
Eschscholzia californica	California poppy	UPL
Festuca perennis	Italian ryegrass	FAC
Galium aparine	Goose grass	FACU
Geranium dissectum	Cut-leaf geranium	UPL
Geranium molle	Dove's-foot geranium	UPL
Hirschfeldia incana	Short-podded mustard	UPL
Hordeum marinum subsp. gussoneanum	Mediterranean barley	FAC
Hordeum murinum	Wall barley	FACU
Hypericum perforatum subsp. perforatum	Klamathweed	FACU
Hypochaeris glabra	Smooth cat's-ear	UPL
Juncus mexicanus	Mexican rush	FACW

Taxon	Common Name	Wetland Status
Juncus xiphioides	Iris-leaved rush	OBL
Lactuca serriola	Prickly lettuce	FACU
Lamium amplexicaule	Deadnettle	UPL
Lupinus bicolor	Miniature lupine	UPL
Lythrum hyssopifolia	Hyssop loosestrife	OBL
Melilotus sp.	Melilotus	UPL
Nasturtium officinale	Watercress	OBL
Olea europaea	Olive	UPL
Paspalum dilatatum	Dallis grass	FAC
Pinus sabiniana	Gray pine	UPL
Plantago lanceolata	English plantain	FAC
Polypogon monspeliensis	Annual beard grass	FACW
Populus fremontii subsp. fremontii	Fremont cottonwood	FAC
Prunus dulcis	Almond tree	UPL
Pyracantha sp.	Pyracantha	UPL
Pyrus sp.	Pear	UPL
Quercus douglasii	Blue oak	UPL
Quercus lobata	Valley oak	FACU
Quercus wislizeni	Interior live oak	UPL
Rubus armeniacus	Himalayan blackberry	FACU
Rumex crispus	Curly dock	FAC
Salix exigua var. exigua	Narrowleaf willow	FACW
Salix lasiolepis	Arroyo willow	FACW
Silybum marianum	Milk thistle	UPL
Sonchus asper subsp. asper	Prickly sow-thistle	FAC
Spartium junceum	Spanish broom	UPL
Torilis arvensis	Field hedgeparsley	UPL
Toxicodendron diversilobum	Western poison-oak	FACU
Trifolium hirtum	Rose clover	UPL
Verbascum blattaria	Moth mullein	UPL
Verbascum thapsus	Woolly mullein	FACU
Veronica sp.	Speedwell	VARIES
Vicia sativa	Common vetch	FACU
Vicia villosa	Winter vetch	UPL
Vinca major	Periwinkle	UPL

Appendix C.
USACOE Aquatic Resources Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Wetland Swale-1	CALIFORNIA	PEM2	SLOPE	Area	0.125	ACRE	DELINEATE	38.80860477	-121.2046204	Sucker Ravine
Wetland Swale-2	CALIFORNIA	PEM1	SLOPE	Area	0.012	ACRE	DELINEATE	38.80984881	-121.2025173	Sucker Ravine
Wetland Swale-3	CALIFORNIA	PEM2	SLOPE	Area	0.016	ACRE	DELINEATE	38.80752123	-121.2052995	Sucker Ravine

Attachment 1.
USACOE Verification Letter, March 2009

ATTACHMENT 1

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

RECEIVED
MAR 26 2009
BY:----------

REPLY TO ATTENTION OF

March 20, 2009

Regulatory Division (SPK-2008-00630)

Stephen Patterson
Patterson Properties
2270 Douglas Boulevard, Suite 111
Roseville, California 95661

Dear Mr. Patterson:

We are responding to your consultant's request for an approved jurisdictional determination for the Sierra-Brace Property. This approximately 17.88-acre site is located in Section 28, Township 11 North, Range 7 East, MDB&M, Latitude 38.808793° North, Longitude 121.203869° West, near the City of Rocklin and Town of Loomis, Placer County, California.

Based on available information, we concur with the estimate of waters of the United States, as depicted on the February 28, 2008, *Appendix C, Wetland Delineation Map, Sierra-Brace Study Area, Town of Loomis, Placer County, CA,* drawing prepared by North Fork Associates. Approximately 0.14 acre of waters of the United States, including wetlands, is present within the survey area. These waters are regulated under Section 404 of the Clean Water Act, since they are tributary to an unnamed intermittent stream, which is tributary to Secret Ravine, which is tributary to Miner's Ravine, which is tributary to Dry Creek, which is tributary to the Natomas East Main Drainage Canal, which is tributary to the Sacramento River, a navigable water of the United States.

This verification is valid for five years from the date of this letter, unless new information warrants revision of the determination before the expiration date. This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331.

A Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form is enclosed. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDS-O, 1455 Market Street, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 60 days from the date of this letter. It is

not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This determination has been conducted to identify the limits of Corps of Engineers' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please complete our customer survey at *http://www.spk.usace.army.mil/customer_survey.html*. Your passcode is "conigliaro".

Please refer to identification number SPK-2008-00630 in any correspondence concerning this project. If you have any questions, please contact (b) (6) at our California North Branch, 1325 J Street, Room 1480, Sacramento, California, 95814-2922, email (b) (6) *@usace.army.mil*, or telephone (916) 557-6740. You may also use our website: *www.spk.usace.army.mil/regulatory.html*.

Sincerely,

ORIGINAL SIGNED

(b) (6)
Chief, California North Branch

Enclosure(s)

Copy furnished without enclosure(s)

✓ Pat Britton, North Fork Associates, 110 Maple Street, Auburn, California 95603
William Marshall, Storm Water and Water Quality Certification Unit, California Regional Water Quality Control Board, Central Valley Region, 11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Kent Smith, California Department of Fish and Game, Region 2, 1701 Nimbus Drive, Rancho Cordova, California 95670-4599
U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
Robert Leidy, Environmental Protection Agency, WRT-8, 75 Hawthorne Street, San Francisco, California 94105
Rodney R. McInnis, Acting Regional Administrator, National Marine Fisheries Service, 650 Capital Mall, Suite 8-300, Sacramento, California 95814-4706

Arborist Report

Mann Made Resources
Arborist Consulting and Tree Conservation Products

December 9, 2016

Mr. Steve Calcagno
Kier & Wright Civil Engineers & Surveyors
2850 Collier Canyon Road
Livermore, CA 94551

SUBJECT: ARBORISTS REPORT FOR COSTCO SITE, LOOMIS, CA

Dear Mr. Calcagno,

Thank you for the opportunity to provide Arborist Consulting Services. The trees on the subject property were inspected on Friday, Saturday, and Sunday, November 18, 19, and 20, and December 9, 2016, and this report provides the findings from the inspections.

Assignment and Background: You contacted my office on October 30th to request an arborist inspection of the trees located within the construction site in Loomis on Sierra College Boulevard and Brace Road for a proposed Costco. I provided a proposal, and you provided the site image to work from. The assignment was to list all Blue Oak trees 4 inches diameter and greater, and all Live Oak and Valley Oak trees 6 inches diameter and greater. You also asked for an estimate of the mitigation required for the removal of the trees on the property.

Observations: The site was inspected on Friday, Saturday, and Sunday, November 18, 19, and 20, with a re-visit on Friday, December 9, 2016 to capture 9 trees that were not completed during the previous site visits. The site is an open area surrounded by fencing, bordered by Sierra College Boulevard top the west, Brace Road to the north, and the Rocklin Border to the south. An apartment complex is adjacent to the property on Brace Road, and the entry gate to the property was behind the driveway into the apartment complex. There is a piece of excess property to the east of the apartment complex that was included in the survey. Twenty eight trees were found to be in the excess property.

Prior to beginning the survey, I reviewed the Loomis Tree Preservation Ordinance to assure the data collected meets their requirements. A Trimble Geo7X unit was used to capture the data and tree locations. A tree ID number was listed on the map image, and the tree tag number was listed for each tree, and the data spreadsheet lists both numbers for easier field identification. The Tree ID number is shown on the KMZ file except for the last 9 trees along Brace Road that were captured using Google Earth, and the Tree ID number and the tag number are the same for those trees.

12661 Torrey Pines Drive, Auburn, CA 95602
(650) 740-3461 ♦ FAX (530) 268-0926
www.mannandtrees.com

Each Oak tree was visited and measured. Undersized trees were not listed. Most of the trees had 1 or two previous tag numbers, and a new number was given to each tree for this inspection. Three trees were double numbered with 301, 302, and 303, before I caught that the same numbers were already used. The double number trees are differentiated by the Tree ID numbers. The tag I installed has the nail head tilted downward so the tag falls away from the tree. Tree tags are typically good for at least three years. After three years, tags may need to be replaced as the tree can grow over the tag which makes the tag number unable to be read. Each tree ID number is the number shown on the KMZ file aerial image.

The required data to be collected was:

i. Tree number
ii. Tree species/common name
iii. Diameter at 4.5' above grade, or the best measurement for diameter if 4.5 was not a good representation of the trunk diameter.
iv. Condition determined by combining vigor, structure, and ability to grow on the site, rated from Excellent, Good, Fair, Major Problems, Extreme Problems, or Dead. Condition ratings are used to calculate mitigation requirements.
v. Comments supporting the condition rating.

All of the trees were viewed while standing on the ground. The diameter was measured using a diameter tape. A probe was used to learn the depth of cavities. A mallet was used to sound the wood and listen for hollow spots.

Three Hundred Seventy Two (372) trees were listed as being of protected size. One hundred sixty two (162) trees were found to be in good or fair condition. Two hundred ten (210) trees were found to be in poor, very poor, or dead condition. The inspection data is shown on the attached 20 page spreadsheet.

Other testing or examination: No other testing or examination was agreed to as part of the inspection assignment.

Discussion: The Town's Tree Preservation Ordinance provided the requirements for data collection. Blue Oaks 4 inches diameter and greater, and Valley and Live Oaks 6 inches diameter and greater are considered Protected Trees.

A total of 372 trees were listed found to be of protected size. Of the 372 total trees, 210 trees were found to be in condition rating 2, 1, and 0, and do not require mitigation. Of the 210 trees, 168 trees were found to be in poor condition, a numerical 2 rating, considered major problems. Thirty eight (38) trees were found to be in very poor condition a 1 rating, considered extreme problems. Four (4) trees were found to be dead, a zero rating.

One hundred sixty two (162) trees were found to be in good and fair condition. Eight (8) trees were found to be in good condition, a 4 rating. Fifteen (15) #15 container size trees are required for mitigation. One hundred fifty four (154) trees were found to be in fair condition, a 3 rating. Two Hundred Seventy Five (275) #15 container size trees are required for mitigation. Per the Town's ordinance, a total of 290 #15 container size trees may be required to be planted on the site for mitigation.

Two (2) of the existing trees in good and fair condition were found to be blue oaks, and require higher mitgation planting. Eighty six (86) of the existing trees were found to be Live Oaks. Two hundred eighty four trees were found to be Valle Oaks.

The spreadsheet includes the tree map ID number, the tree tag number, common name, species, diameter at 4.5 measurement or other appropriate location, tree condition using the Town of Loomis 0-5 rating system, and comments with notes supporting the condition rating. The spreadsheet is sorted 3 ways, by tree tag number, tree condition to calculate mitigation planting, and by species.

Conclusion: Three hundred seventy two (372) trees were found to be of protected size. Of those trees, 162 were found to be in good and fair condition for a total mitigation planting requirement of potentially 290 #15 container trees. It should be possible to plant these trees on the property as part of the project landscape design and parking lot shade.

Certification: I certify that all the statements in this report are true, complete and correct to the best of my knowledge, and that all statements were made in good faith.

Please contact me at 650-740-3461 or at gordon@mannandtrees.com if you have any questions about this report or if additional services are desired.

Respectfully submitted,

Gordon Mann, Consulting Arborist
2011 ISA True Professional of Arboriculture
Registered Consulting Arborist #480
Certified Arborist #WE-0151AM
Certified Urban Forester #127
ISA TRAQ Qualified Tree Risk Assessor

Mann Made Resources
12661 Torrey Pines Drive
Auburn, CA 95602
650-740-3461
www.mannandtrees.com

Attachments: Site image with tree ID numbers
Spreadsheet of trees sorted by tree number, species, and condition
KMZ file for aerial image with GPS coordinates

Assumptions and Limitations: This report provides information about the subject trees at the time of the inspection. Trees and conditions may change over time. This report is only valid for the conditions present at the time of the inspection. All observations were made while standing on the ground. The inspection consisted of visual observations. No further examinations were requested or performed.

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the options and recommendations of the arborist, or seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that can fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatments, pruning, and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, landlord-tenant matters, etc. Arborists cannot take such issues into account unless complete and accurate information is given to the arborist. The person hiring the arborist accepts full responsibility for authorizing the treatment options or remedial measures.

Trees can be managed, but they cannot be controlled. To live near a tree is to accept some degree of risk. The only way to eliminate all risks associated with trees is to eliminate all trees.

Appendix D Noise Monitoring and Modeling

Long-Term 24 Hour Continuous Noise Monitoring
Model Input Sheet

AECOM

Project: 60550073 - Loomis Costco EIR

Date: Existi **Tuesday, November 07, 2017** **Wednesday, November 08, 2017**

Site: Project Site, Northeastern Boundary

Hour	Leq	Lmax	L50	L90
15:00	51.2	73.7	47.9	43.2
16:00	51.2	66.2	49.4	44.3
17:00	54.6	66.7	53.9	51.9
18:00	54.9	63.7	54.5	52.3
19:00	54.1	62.5	53.4	51.3
20:00	54.1	66.9	53.4	51.4
21:00	53.0	73.3	52.2	50.3
22:00	51.4	64.3	50.9	48.7
23:00	50.3	59.4	49.4	47.1
0:00	48.6	64.0	47.5	44.7
1:00	48.3	66.0	46.8	43.5
2:00	46.6	55.1	46.2	43.2
3:00	48.6	58.5	47.7	45.1
4:00	50.9	67.0	50.2	47.9
5:00	51.7	62.7	51.3	49.5
6:00	54.4	67.1	53.7	51.5
7:00	54.1	66.5	53.5	51.4
8:00	52.0	64.3	50.6	48.5
9:00	49.9	64.8	47.9	44.9
10:00	49.6	68.0	46.6	42.8
11:00	55.0	65.0	54.5	51.9
12:00	55.2	64.4	54.6	50.3
13:00	54.9	67.3	54.3	51.0
14:00	58.3	82.1	55.8	53.5

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	54.1	67.7	52.2	49.3
Nighttime (10 p.m. - 7 a.m.)	50.7	62.7	49.3	46.8

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	58.3	82.1	55.8	53.5
Nighttime (10 p.m. - 7 a.m.)	54.4	67.1	53.7	51.5

Percentage of Energy

Daytime	78%
Nighttime	22%

Calculated L_{dn}, dBA

57.8

Long-Term 24 Hour Continuous Noise Monitoring
Model Input Sheet

AECOM

Project: 60550073 - Loomis Costco EIR

Date: Existi **Tuesday, November 07, 2017** **Wednesday, November 08, 2017**

Site: Project Site, Northeastern Boundary

Hour	Leq	Lmax	L50	L90
16:00	53.2	62.4	52.3	49.4
17:00	59.1	67.5	58.8	56.8
18:00	58.4	65.5	58.1	55.9
19:00	56.9	65.2	56.6	55.0
20:00	57.3	78.0	56.3	54.3
21:00	56.9	66.1	56.2	53.7
22:00	57.1	66.2	56.1	52.3
23:00	55.8	69.7	54.5	50.0
0:00	49.8	58.5	48.1	43.8
1:00	52.8	75.2	49.8	44.4
2:00	48.9	58.4	47.8	43.1
3:00	52.7	60.8	51.5	46.9
4:00	55.6	74.3	54.5	50.6
5:00	55.5	63.1	55.2	51.9
6:00	57.8	66.9	57.2	55.3
7:00	55.9	60.8	55.6	52.6
8:00	53.2	60.3	53.1	51.4
9:00	51.8	64.5	51.3	49.2
10:00	51.0	61.3	50.3	48.2
11:00	56.4	60.9	56.0	54.1
12:00	56.7	63.5	56.0	53.0
13:00	56.5	70.8	55.9	52.9
14:00	57.5	62.9	57.3	55.7
15:00	58.4	65.0	58.1	56.2

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	56.5	65.0	55.5	53.2
Nighttime (10 p.m. - 7 a.m.)	54.9	65.9	52.7	48.7

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	59.1	78.0	58.8	56.8
Nighttime (10 p.m. - 7 a.m.)	57.8	75.2	57.2	55.3

Percentage of Energy

Daytime	71%
Nighttime	29%

Calculated L_{dn}, dBA

61.6

Project-Generated Construction Source Noise Prediction Model

Loomis Costco EIR

AECOM

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	646	60
	50	88
LT-01-Ldn	125	78
ST_001	100	80
ST_003	100	80
ST_004	100	80
ST_005	100	80

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Excavator	85	0.4
Dump Truck	84	0.4
Dozer	85	0.4
Grader	85	0.4
Pickup Truck	55	0.4
Backhoe	80	0.4
Generator	82	0.5

Ground Type	Soft
Ground Factor	0.50

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Excavator	81.0
Dump Truck	80.0
Dozer	81.0
Grader	81.0
Pickup Truck	51.0
Backhoe	76.0
Generator	79.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
87.8

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, J

[2] Based on the following from the Federal Transit Noise and Vibrat

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

Loomis Costco EIR

AECOM

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	585	60
	50	87
LT-01-Ldn	125	77
ST_001	100	79
ST_003	100	79
ST_004	100	79
ST_005	100	79

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Excavator	85	0.4
Dozer	85	0.4
Flat Bed Truck	84	0.4
Crane	85	0.16
Man Lift	85	0.2

Ground Type	Soft
Ground Factor	0.50

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Excavator	81.0
Dozer	81.0
Flat Bed Truck	80.0
Crane	77.0
Man Lift	78.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
86.7

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, J

[2] Based on the following from the Federal Transit Noise and Vibrat

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

Loomis Costco EIR

AECOM

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	1,112	60
	50	87
LT-01-Ldn	125	79
ST_001	100	81
ST_003	100	81
ST_004	100	81
ST_005	100	81

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Paver	85	0.5
Concrete Mixer Truck	85	0.4
Man Lift	85	0.2
Compactor (ground)	80	0.2
Concrete Mixer Truck	85	0.4

Ground Type	hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Paver	82.0
Concrete Mixer Truck	81.0
Man Lift	78.0
Compactor (ground)	73.0
Concrete Mixer Truck	81.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
86.9

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, J

[2] Based on the following from the Federal Transit Noise and Vibrat

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Parking Lot Noise Prediction Model

Loomis Costco Enironmental Impact Report

AECOM

Ref SEL: 71 **Metric: Leq**

Description	# of Stalls	Trip Multiplier	Trips /Period	Lp @ 50'	Distance to Rec.	Shielding Offset	Lp at Rec.
LT-1	80	1	80	54.4	65		52
ST-03	100	1	100	55.4	75		52
ST-04	100	1	100	55.4	75		52

AECOM

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing AM Peak
Ground Type : Hard
K Factor : NA
Metric (L_{eq}, L_{dn}, CNEL) : Leq
Traffic Desc. (Peak or ADT) : Peak

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
6N	Sierra College Boulevard	King Road	Taylor Road	1094	50	100	93	2	5	75	0	25	
6S	Sierra College Boulevard	Taylor Road	Brace Road	1442	45	100	93	2	5	75	0	25	
7S	Sierra College Boulevard	Brace Road	Granite Drive	1412	40	100	93	2	5	75	0	25	
8S	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	1815	40	100	93	2	5	75	0	25	
12S	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	1958	50	100	93	2	5	75	0	25	
17N	Granite Drive	Rocklin Road	Sierra College Boulevard	1031	30	100	93	2	5	75	0	25	
2S	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	778	40	100	93	2	5	75	0	25	
6W	Taylor Road	Sierra College Boulevard	Delmar Avenue	751	45	100	93	2	5	75	0	25	
15S	Pacific Street	Delmar Avenue	Rocklin Road	875	45	100	93	2	5	75	0	25	
5W	Brace Road	Barton Road	Sierra College Boulevard	267	35	100	93	2	5	75	0	25	
20E	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	2157	40	100	93	2	5	75	0	25	
14N	Rocklin Road	Interstate 80 Ramps	Granite Drive	1608	40	100	93	2	5	75	0	25	
17W	Rocklin Road	Granite Drive	Pacific Street	1600	35	100	93	2	5	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing AM Peak
Metric (Leq, Ldn, CNEL) : Leq

		Segment		Noise Levels, dB Leq				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
6N	Sierra College Boulevard	King Road	Taylor Road	65.8	56.8	65.0	68.7	74	235	743	2351	7435
6S	Sierra College Boulevard	Taylor Road	Brace Road	65.7	57.3	65.7	69.0	80	253	801	2532	8006
7S	Sierra College Boulevard	Brace Road	Granite Drive	64.1	56.4	65.2	68.0	63	200	633	2001	6327
8S	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	65.2	57.5	66.3	69.1	81	257	813	2572	8133
12S	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	68.3	59.3	67.5	71.2	133	421	1331	4208	13307
17N	Granite Drive	Rocklin Road	Sierra College Bou	59.2	53.1	64.2	65.6	36	115	364	1152	3642
2S	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	61.5	53.8	62.6	65.4	35	110	349	1102	3486
6W	Taylor Road	Sierra College Bou	Delmar Avenue	62.9	54.4	62.9	66.2	42	132	417	1318	4169
15S	Pacific Street	Delmar Avenue	Rocklin Road	63.5	55.1	63.6	66.9	49	154	486	1536	4858
5W	Brace Road	Barton Road	Sierra College Bou	55.2	48.2	57.4	59.8	10	30	95	301	952
20E	Rocklin Road	Sierra College Bou	Interstate 80 Ram	66.0	58.2	67.0	69.9	97	306	967	3057	9666
14N	Rocklin Road	Interstate 80 Ram	Granite Drive	64.7	56.9	65.8	68.6	72	228	721	2279	7206
17W	Rocklin Road	Granite Drive	Pacific Street	63.0	56.0	65.2	67.6	57	180	571	1805	5707

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing + Construction Traffic
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Leq **Traffic Desc. (Peak or ADT) :** Peak

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	1150	50	100	93	2	5	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	1498	45	100	93	2	5	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	1468	40	100	93	2	5	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	1871	40	100	93	2	5	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	2014	50	100	93	2	5	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	1087	30	100	93	2	5	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	834	40	100	93	2	5	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	807	45	100	93	2	5	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	931	45	100	93	2	5	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	323	35	100	93	2	5	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	2213	40	100	93	2	5	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	1664	40	100	93	2	5	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	1656	35	100	93	2	5	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing + Construction Traffic
Metric (Leq, Ldn, CNEL) : Leq

		Segment		Noise Levels, dB Leq				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	66.0	57.0	65.2	68.9	78	247	781	2471	7813
2	Sierra College Boulevard	Taylor Road	Brace Road	65.9	57.4	65.9	69.2	83	263	831	2629	8314
3	Sierra College Boulevard	Brace Road	Granite Drive	64.3	56.6	65.4	68.2	66	208	658	2080	6576
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	65.4	57.6	66.4	69.2	84	265	838	2651	8382
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	68.5	59.4	67.6	71.4	137	433	1368	4327	13684
6	Granite Drive	Rocklin Road	Sierra College Bou	59.4	53.3	64.4	65.8	38	121	384	1214	3839
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	61.8	54.1	62.9	65.7	37	118	374	1181	3735
8	Taylor Road	Sierra College Bou	Delmar Avenue	63.2	54.8	63.2	66.5	45	142	448	1416	4478
9	Pacific Street	Delmar Avenue	Rocklin Road	63.8	55.4	63.8	67.1	52	163	517	1634	5166
10	Brace Road	Barton Road	Sierra College Bou	56.1	49.1	58.2	60.6	12	36	115	364	1151
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	66.1	58.3	67.1	70.0	99	314	991	3135	9915
12	Rocklin Road	Interstate 80 Ram	Granite Drive	64.8	57.1	65.9	68.7	75	236	745	2357	7455
13	Rocklin Road	Granite Drive	Pacific Street	63.2	56.2	65.3	67.7	59	187	591	1868	5906
0												
0												
0												
0												

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing No Project Weekday
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	Sierra College Boulevard	King Road	Taylor Road	10940	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	14420	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	14120	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	18150	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	19580	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	10310	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	7780	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	7510	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	8750	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	2670	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	21570	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	16080	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	16000	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing No Project Weekday
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	Sierra College Boulevard	King Road	Taylor Road	67.4	58.2	59.3	68.4	70	220	696	2201	6960
2	Sierra College Boulevard	Taylor Road	Brace Road	67.2	58.6	60.1	68.5	71	223	706	2232	7060
3	Sierra College Boulevard	Brace Road	Granite Drive	65.7	57.7	59.6	67.2	52	164	520	1643	5196
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	66.8	58.8	60.7	68.2	67	211	668	2112	6679
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	69.9	60.7	61.9	71.0	125	394	1246	3939	12457
6	Granite Drive	Rocklin Road	Sierra College Bou	60.7	54.4	58.5	63.4	22	69	217	687	2172
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	63.1	55.2	57.0	64.6	29	91	286	905	2863
8	Taylor Road	Sierra College Bou	Delmar Avenue	64.4	55.8	57.3	65.7	37	116	368	1163	3677
9	Pacific Street	Delmar Avenue	Rocklin Road	65.1	56.5	58.0	66.3	43	135	428	1355	4284
10	Brace Road	Barton Road	Sierra College Bou	56.8	49.6	51.8	58.6	7	23	72	227	718
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	67.5	59.6	61.4	69.0	79	251	794	2510	7938
12	Rocklin Road	Interstate 80 Ram	Granite Drive	66.2	58.3	60.1	67.7	59	187	592	1871	5917
13	Rocklin Road	Granite Drive	Pacific Street	64.6	57.4	59.6	66.3	43	136	431	1361	4305

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing No Project Weekend
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	8300	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	12770	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	13760	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	16420	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	14850	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	11810	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	8170	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	7350	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	8140	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	2650	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	13780	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	14290	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	11910	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing No Project Weekend
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	66.2	57.0	58.1	67.2	53	167	528	1670	5280
2	Sierra College Boulevard	Taylor Road	Brace Road	66.7	58.1	59.6	68.0	63	198	625	1977	6252
3	Sierra College Boulevard	Brace Road	Granite Drive	65.6	57.6	59.4	67.0	51	160	506	1601	5064
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	66.3	58.4	60.2	67.8	60	191	604	1911	6043
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	68.7	59.5	60.7	69.8	94	299	945	2988	9447
6	Granite Drive	Rocklin Road	Sierra College Bou	61.3	55.0	59.1	64.0	25	79	249	787	2488
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	63.3	55.4	57.2	64.8	30	95	301	951	3007
8	Taylor Road	Sierra College Bou	Delmar Avenue	64.3	55.7	57.2	65.6	36	114	360	1138	3598
9	Pacific Street	Delmar Avenue	Rocklin Road	64.8	56.2	57.6	66.0	40	126	399	1260	3985
10	Brace Road	Barton Road	Sierra College Bou	56.7	49.6	51.8	58.5	7	23	71	225	713
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	65.6	57.6	59.5	67.1	51	160	507	1604	5071
12	Rocklin Road	Interstate 80 Ram	Granite Drive	65.7	57.8	59.6	67.2	53	166	526	1663	5259
13	Rocklin Road	Granite Drive	Pacific Street	63.3	56.1	58.3	65.1	32	101	320	1013	3205

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing Plus Project Weekday
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	11040	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	14700	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	14500	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	20030	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	19740	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	10350	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	7900	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	7630	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	8870	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	2710	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	21570	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	16300	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	16040	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing Plus Project Weekday
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	67.4	58.2	59.4	68.5	70	222	702	2221	7024
2	Sierra College Boulevard	Taylor Road	Brace Road	67.3	58.7	60.2	68.6	72	228	720	2276	7197
3	Sierra College Boulevard	Brace Road	Granite Drive	65.8	57.9	59.7	67.3	53	169	534	1687	5336
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	67.2	59.3	61.1	68.7	74	233	737	2331	7371
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	69.9	60.7	61.9	71.0	126	397	1256	3971	12558
6	Granite Drive	Rocklin Road	Sierra College Bou	60.7	54.4	58.6	63.4	22	69	218	689	2180
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	63.2	55.2	57.0	64.6	29	92	291	919	2907
8	Taylor Road	Sierra College Bou	Delmar Avenue	64.5	55.9	57.4	65.7	37	118	374	1181	3735
9	Pacific Street	Delmar Avenue	Rocklin Road	65.1	56.5	58.0	66.4	43	137	434	1373	4342
10	Brace Road	Barton Road	Sierra College Bou	56.8	49.7	51.9	58.6	7	23	73	231	729
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	67.5	59.6	61.4	69.0	79	251	794	2510	7938
12	Rocklin Road	Interstate 80 Ram	Granite Drive	66.3	58.4	60.2	67.8	60	190	600	1897	5998
13	Rocklin Road	Granite Drive	Pacific Street	64.6	57.4	59.6	66.4	43	136	432	1365	4316

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing Plus Project Weekend
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	9050	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	14810	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	16340	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	24190	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	15990	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	12150	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	9070	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	8150	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	8940	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	2880	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	13780	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	15410	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	12250	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Existing Plus Project Weekend
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	66.5	57.3	58.5	67.6	58	182	576	1821	5757
2	Sierra College Boulevard	Taylor Road	Brace Road	67.4	58.8	60.2	68.6	73	229	725	2293	7250
3	Sierra College Boulevard	Brace Road	Granite Drive	66.3	58.4	60.2	67.8	60	190	601	1901	6013
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	68.0	60.1	61.9	69.5	89	282	890	2815	8902
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	69.0	59.8	61.0	70.1	102	322	1017	3217	10173
6	Granite Drive	Rocklin Road	Sierra College Bou	61.4	55.1	59.3	64.1	26	81	256	809	2559
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	63.8	55.8	57.6	65.2	33	106	334	1055	3338
8	Taylor Road	Sierra College Bou	Delmar Avenue	64.8	56.2	57.6	66.0	40	126	399	1262	3990
9	Pacific Street	Delmar Avenue	Rocklin Road	65.2	56.6	58.0	66.4	44	138	438	1384	4377
10	Brace Road	Barton Road	Sierra College Bou	57.1	49.9	52.1	58.9	8	25	77	245	775
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	65.6	57.6	59.5	67.1	51	160	507	1604	5071
12	Rocklin Road	Interstate 80 Ram	Granite Drive	66.1	58.1	59.9	67.5	57	179	567	1793	5671
13	Rocklin Road	Granite Drive	Pacific Street	63.4	56.2	58.4	65.2	33	104	330	1042	3296

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term No Project Weekday
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	14280	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	18310	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	18570	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	22900	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	27330	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	12390	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	9060	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	8780	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	10590	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	3510	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	26440	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	21210	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	21010	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term No Project Weekday
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	68.5	59.3	60.5	69.6	91	287	908	2873	9085
2	Sierra College Boulevard	Taylor Road	Brace Road	68.3	59.7	61.2	69.5	90	283	896	2835	8964
3	Sierra College Boulevard	Brace Road	Granite Drive	66.9	58.9	60.8	68.3	68	216	683	2161	6834
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	67.8	59.8	61.7	69.3	84	266	843	2665	8427
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	71.3	62.1	63.3	72.4	174	550	1739	5498	17387
6	Granite Drive	Rocklin Road	Sierra College Bou	61.5	55.2	59.3	64.2	26	83	261	825	2610
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	63.8	55.8	57.6	65.2	33	105	333	1054	3334
8	Taylor Road	Sierra College Bou	Delmar Avenue	65.1	56.5	58.0	66.3	43	136	430	1359	4298
9	Pacific Street	Delmar Avenue	Rocklin Road	65.9	57.3	58.8	67.1	52	164	518	1639	5185
10	Brace Road	Barton Road	Sierra College Bou	58.0	50.8	53.0	59.8	9	30	94	299	944
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	68.4	60.5	62.3	69.9	97	308	973	3077	9730
12	Rocklin Road	Interstate 80 Ram	Granite Drive	67.4	59.5	61.3	68.9	78	247	781	2468	7805
13	Rocklin Road	Granite Drive	Pacific Street	65.7	58.6	60.8	67.5	57	179	565	1788	5653

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term No Project Weekend
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	13830	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	23500	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	26340	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	29650	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	27330	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	15090	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	14080	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	8750	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	10420	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	4830	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	21220	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	27450	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	20120	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term No Project Weekend
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	68.4	59.2	60.4	69.4	88	278	880	2782	8798
2	Sierra College Boulevard	Taylor Road	Brace Road	69.4	60.8	62.2	70.6	115	364	1150	3638	11505
3	Sierra College Boulevard	Brace Road	Granite Drive	68.4	60.5	62.3	69.9	97	307	969	3065	9693
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	68.9	61.0	62.8	70.4	109	345	1091	3450	10911
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	71.3	62.1	63.3	72.4	174	550	1739	5498	17387
6	Granite Drive	Rocklin Road	Sierra College Bou	62.4	56.1	60.2	65.0	32	101	318	1005	3179
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	65.7	57.7	59.5	67.1	52	164	518	1639	5181
8	Taylor Road	Sierra College Bou	Delmar Avenue	65.1	56.5	58.0	66.3	43	135	428	1355	4284
9	Pacific Street	Delmar Avenue	Rocklin Road	65.8	57.2	58.7	67.1	51	161	510	1613	5101
10	Brace Road	Barton Road	Sierra College Bou	59.3	52.2	54.4	61.1	13	41	130	411	1300
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	67.4	59.5	61.3	68.9	78	247	781	2469	7809
12	Rocklin Road	Interstate 80 Ram	Granite Drive	68.6	60.6	62.4	70.0	101	319	1010	3194	10102
13	Rocklin Road	Granite Drive	Pacific Street	65.5	58.4	60.6	67.3	54	171	541	1712	5414

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term Plus Project Weekday
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	14380	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	18590	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	18950	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	24780	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	24560	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	12430	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	9180	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	8900	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	10710	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	3590	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	26440	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	21370	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	21050	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term Plus Project Weekday
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	68.5	59.3	60.5	69.6	91	289	915	2893	9148
2	Sierra College Boulevard	Taylor Road	Brace Road	68.3	59.7	61.2	69.6	91	288	910	2878	9101
3	Sierra College Boulevard	Brace Road	Granite Drive	67.0	59.0	60.8	68.4	70	221	697	2205	6974
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	68.1	60.2	62.0	69.6	91	288	912	2884	9119
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	70.9	61.7	62.9	71.9	156	494	1562	4941	15625
6	Granite Drive	Rocklin Road	Sierra College Bou	61.5	55.2	59.4	64.2	26	83	262	828	2618
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	63.8	55.9	57.7	65.3	34	107	338	1068	3378
8	Taylor Road	Sierra College Bou	Delmar Avenue	65.1	56.5	58.0	66.4	44	138	436	1378	4357
9	Pacific Street	Delmar Avenue	Rocklin Road	66.0	57.3	58.8	67.2	52	166	524	1658	5243
10	Brace Road	Barton Road	Sierra College Bou	58.1	50.9	53.1	59.8	10	31	97	305	966
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	68.4	60.5	62.3	69.9	97	308	973	3077	9730
12	Rocklin Road	Interstate 80 Ram	Granite Drive	67.5	59.5	61.4	69.0	79	249	786	2487	7864
13	Rocklin Road	Granite Drive	Pacific Street	65.7	58.6	60.8	67.5	57	179	566	1791	5664

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term Plus Project Weekend
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	14580	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	25540	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	28820	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	37420	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	28470	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	15430	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	14980	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	9550	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	11220	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	5060	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	21220	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	27730	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	20460	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Short Term Plus Project Weekend
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	68.6	59.4	60.6	69.7	93	293	928	2933	9276
2	Sierra College Boulevard	Taylor Road	Brace Road	69.7	61.1	62.6	71.0	125	395	1250	3954	12504
3	Sierra College Boulevard	Brace Road	Granite Drive	68.8	60.8	62.7	70.3	106	335	1061	3354	10606
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	69.9	62.0	63.8	71.4	138	435	1377	4355	13770
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	71.5	62.3	63.5	72.6	181	573	1811	5728	18112
6	Granite Drive	Rocklin Road	Sierra College Bou	62.5	56.2	60.3	65.1	33	103	325	1028	3250
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	65.9	58.0	59.8	67.4	55	174	551	1743	5513
8	Taylor Road	Sierra College Bou	Delmar Avenue	65.5	56.8	58.3	66.7	47	148	468	1478	4675
9	Pacific Street	Delmar Avenue	Rocklin Road	66.2	57.5	59.0	67.4	55	174	549	1737	5493
10	Brace Road	Barton Road	Sierra College Bou	59.6	52.4	54.6	61.3	14	43	136	431	1362
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	67.4	59.5	61.3	68.9	78	247	781	2469	7809
12	Rocklin Road	Interstate 80 Ram	Granite Drive	68.6	60.7	62.5	70.1	102	323	1020	3227	10205
13	Rocklin Road	Granite Drive	Pacific Street	65.6	58.5	60.6	67.4	55	174	551	1741	5505

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term No Project Weekday
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	26500	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	31550	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	29900	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	34750	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	37200	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	12500	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	13720	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	10850	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	15300	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	5800	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	29250	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	31550	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	23900	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term No Project Weekday
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	71.2	62.0	63.2	72.3	169	533	1686	5331	16859
2	Sierra College Boulevard	Taylor Road	Brace Road	70.6	62.0	63.5	71.9	154	488	1545	4884	15446
3	Sierra College Boulevard	Brace Road	Granite Drive	68.9	61.0	62.8	70.4	110	348	1100	3479	11003
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	69.6	61.7	63.5	71.1	128	404	1279	4044	12788
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	72.7	63.5	64.7	73.7	237	748	2367	7484	23666
6	Granite Drive	Rocklin Road	Sierra College Bou	61.6	55.3	59.4	64.2	26	83	263	833	2633
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	65.6	57.6	59.4	67.0	50	160	505	1597	5049
8	Taylor Road	Sierra College Bou	Delmar Avenue	66.0	57.4	58.9	67.3	53	168	531	1680	5312
9	Pacific Street	Delmar Avenue	Rocklin Road	67.5	58.9	60.4	68.7	75	237	749	2369	7490
10	Brace Road	Barton Road	Sierra College Bou	60.1	53.0	55.2	61.9	16	49	156	494	1561
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	68.8	60.9	62.7	70.3	108	340	1076	3404	10764
12	Rocklin Road	Interstate 80 Ram	Granite Drive	69.2	61.2	63.1	70.6	116	367	1161	3671	11610
13	Rocklin Road	Granite Drive	Pacific Street	66.3	59.1	61.3	68.1	64	203	643	2034	6431

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term No Project Weekdend
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	16950	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	26850	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	29700	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	30100	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	30300	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	12150	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	12750	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	9050	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	14750	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	7600	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	20000	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	30600	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	12250	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term No Project Weekdend
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	69.3	60.1	61.2	70.3	108	341	1078	3410	10783
2	Sierra College Boulevard	Taylor Road	Brace Road	69.9	61.3	62.8	71.2	131	416	1314	4157	13145
3	Sierra College Boulevard	Brace Road	Granite Drive	68.9	61.0	62.8	70.4	109	346	1093	3456	10930
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	69.0	61.0	62.8	70.4	111	350	1108	3503	11077
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	71.8	62.6	63.8	72.9	193	610	1928	6096	19276
6	Granite Drive	Rocklin Road	Sierra College Bou	61.4	55.1	59.3	64.1	26	81	256	809	2559
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	65.2	57.3	59.1	66.7	47	148	469	1484	4692
8	Taylor Road	Sierra College Bou	Delmar Avenue	65.2	56.6	58.1	66.5	44	140	443	1401	4431
9	Pacific Street	Delmar Avenue	Rocklin Road	67.3	58.7	60.2	68.6	72	228	722	2284	7221
10	Brace Road	Barton Road	Sierra College Bou	61.3	54.2	56.3	63.1	20	65	204	647	2045
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	67.2	59.3	61.1	68.7	74	233	736	2327	7360
12	Rocklin Road	Interstate 80 Ram	Granite Drive	69.0	61.1	62.9	70.5	113	356	1126	3561	11261
13	Rocklin Road	Granite Drive	Pacific Street	63.4	56.2	58.4	65.2	33	104	330	1042	3296

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term Plus Project Weekday
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	26600	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	31830	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	30280	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	36630	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	37360	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	12540	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	13340	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	10970	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	15420	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	5840	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	29250	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	31710	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	23640	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term Plus Project Weekday
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	71.2	62.0	63.2	72.3	169	535	1692	5351	16923
2	Sierra College Boulevard	Taylor Road	Brace Road	70.7	62.1	63.6	71.9	156	493	1558	4928	15583
3	Sierra College Boulevard	Brace Road	Granite Drive	69.0	61.1	62.9	70.5	111	352	1114	3524	11143
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	69.8	61.9	63.7	71.3	135	426	1348	4263	13480
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	72.7	63.5	64.7	73.8	238	752	2377	7516	23768
6	Granite Drive	Rocklin Road	Sierra College Bou	61.6	55.3	59.4	64.2	26	84	264	835	2641
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	65.4	57.5	59.3	66.9	49	155	491	1552	4909
8	Taylor Road	Sierra College Bou	Delmar Avenue	66.1	57.4	58.9	67.3	54	170	537	1698	5371
9	Pacific Street	Delmar Avenue	Rocklin Road	67.5	58.9	60.4	68.8	75	239	755	2387	7549
10	Brace Road	Barton Road	Sierra College Bou	60.2	53.0	55.2	62.0	16	50	157	497	1571
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	68.8	60.9	62.7	70.3	108	340	1076	3404	10764
12	Rocklin Road	Interstate 80 Ram	Granite Drive	69.2	61.3	63.1	70.7	117	369	1167	3690	11669
13	Rocklin Road	Granite Drive	Pacific Street	66.2	59.1	61.3	68.0	64	201	636	2012	6361

Traffic Noise Prediction Model, (FHWA RD-77-108)

Model Input Sheet

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term Plus Project Weekdend
Ground Type : Hard **K Factor :** NA
Metric (L_{eq}, L_{dn}, CNEL) : Ldn **Traffic Desc. (Peak or ADT) :** ADT

Segment	Roadway	Segment From	Segment To	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	Offset (dB)
1	6N	King Road	Taylor Road	17700	50	100	97	2	1	75	0	25	
2	Sierra College Boulevard	Taylor Road	Brace Road	28890	45	100	97	2	1	75	0	25	
3	Sierra College Boulevard	Brace Road	Granite Drive	32180	40	100	97	2	1	75	0	25	
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ramps	37870	40	100	97	2	1	75	0	25	
5	Sierra College Boulevard	Interstate 80 Ramps	Rocklin Road	31440	50	100	97	2	1	75	0	25	
6	Granite Drive	Rocklin Road	Sierra College Boulevard	15640	30	100	97	2	1	75	0	25	
7	Taylor Road	Horseshoe Bar Road	Sierra College Boulevard	13650	40	100	97	2	1	75	0	25	
8	Taylor Road	Sierra College Boulevard	Delmar Avenue	9850	45	100	97	2	1	75	0	25	
9	Pacific Street	Delmar Avenue	Rocklin Road	15550	45	100	97	2	1	75	0	25	
10	Brace Road	Barton Road	Sierra College Boulevard	7830	35	100	97	2	1	75	0	25	
11	Rocklin Road	Sierra College Boulevard	Interstate 80 Ramps	20000	40	100	97	2	1	75	0	25	
12	Rocklin Road	Interstate 80 Ramps	Granite Drive	31750	40	100	97	2	1	75	0	25	
13	Rocklin Road	Granite Drive	Pacific Street	18140	35	100	97	2	1	75	0	25	

Traffic Noise Prediction Model, (FHWA RD-77-108)

Predicted Noise Levels

AECOM

Project Name : 60550073 - Loomis Costco EIR
Project Number : 60550073
Modeling Condition : Cumulative Long Term Plus Project Weekdend
Metric (Leq, Ldn, CNEL) : Ldn

		Segment		Noise Levels, dB Ldn				Distance to Traffic Noise Contours, Feet				
Segment	Roadway	From	To	Auto	MT	HT	Total	70 dB	65 dB	60 dB	55 dB	50 dB
1	6N	King Road	Taylor Road	69.5	60.2	61.4	70.5	113	356	1126	3561	11261
2	Sierra College Boulevard	Taylor Road	Brace Road	70.3	61.7	63.1	71.5	141	447	1414	4473	14144
3	Sierra College Boulevard	Brace Road	Granite Drive	69.3	61.3	63.1	70.7	118	374	1184	3745	11842
4	Sierra College Boulevard	Granite Drive	Interstate 80 Ram	70.0	62.0	63.8	71.4	139	441	1394	4407	13936
5	Sierra College Boulevard	Interstate 80 Ram	Rocklin Road	71.9	62.7	63.9	73.0	200	633	2000	6325	20002
6	Granite Drive	Rocklin Road	Sierra College Bou	62.5	56.2	60.4	65.2	33	104	329	1042	3294
7	Taylor Road	Horseshoe Bar Ro	Sierra College Bou	65.5	57.6	59.4	67.0	50	159	502	1588	5023
8	Taylor Road	Sierra College Bou	Delmar Avenue	65.6	57.0	58.5	66.8	48	152	482	1525	4822
9	Pacific Street	Delmar Avenue	Rocklin Road	67.6	59.0	60.5	68.8	76	241	761	2407	7613
10	Brace Road	Barton Road	Sierra College Bou	61.4	54.3	56.5	63.2	21	67	211	666	2107
11	Rocklin Road	Sierra College Bou	Interstate 80 Ram	67.2	59.3	61.1	68.7	74	233	736	2327	7360
12	Rocklin Road	Interstate 80 Ram	Granite Drive	69.2	61.3	63.1	70.7	117	369	1168	3695	11684
13	Rocklin Road	Granite Drive	Pacific Street	65.1	57.9	60.1	66.9	49	154	488	1544	4881

Appendix E Traffic Study

Transportation Impact Analysis

Loomis Costco Warehouse

Loomis, California

October 2019

KITTELSON & ASSOCIATES

Transportation Impact Analysis

Costco Warehouse TIA

Loomis, California

Prepared For:
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Prepared By:
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Project No. 20345

October 2019

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Section 1 Executive Summary

EXECUTIVE SUMMARY

Costco Wholesale Corporation (Costco) proposes to develop a new warehouse with a tire center and fuel station (collectively referred to as the "Project") in The Town of Loomis (Town) along the east side of Sierra College Boulevard south of Brace Road. The Project includes a Costco Warehouse building measuring approximately 155,000 square feet, a Costco Gasoline fuel station with up to 30 fueling positions and supporting parking.

The proposed site plan provides access to the site at three locations including a new signalized intersection on Sierra College Boulevard, a right-in/right-out only driveway located on Brace Road, and a full movement driveway located further east on Brace Road. In addition to analyzing the traffic impacts associated with the proposed site access (Project Driveway Option 1A), study intersection traffic operations are documented in this report for two alternative site access options for comparison purposes. For ease of identification, the access options will be referenced in this report as follows:

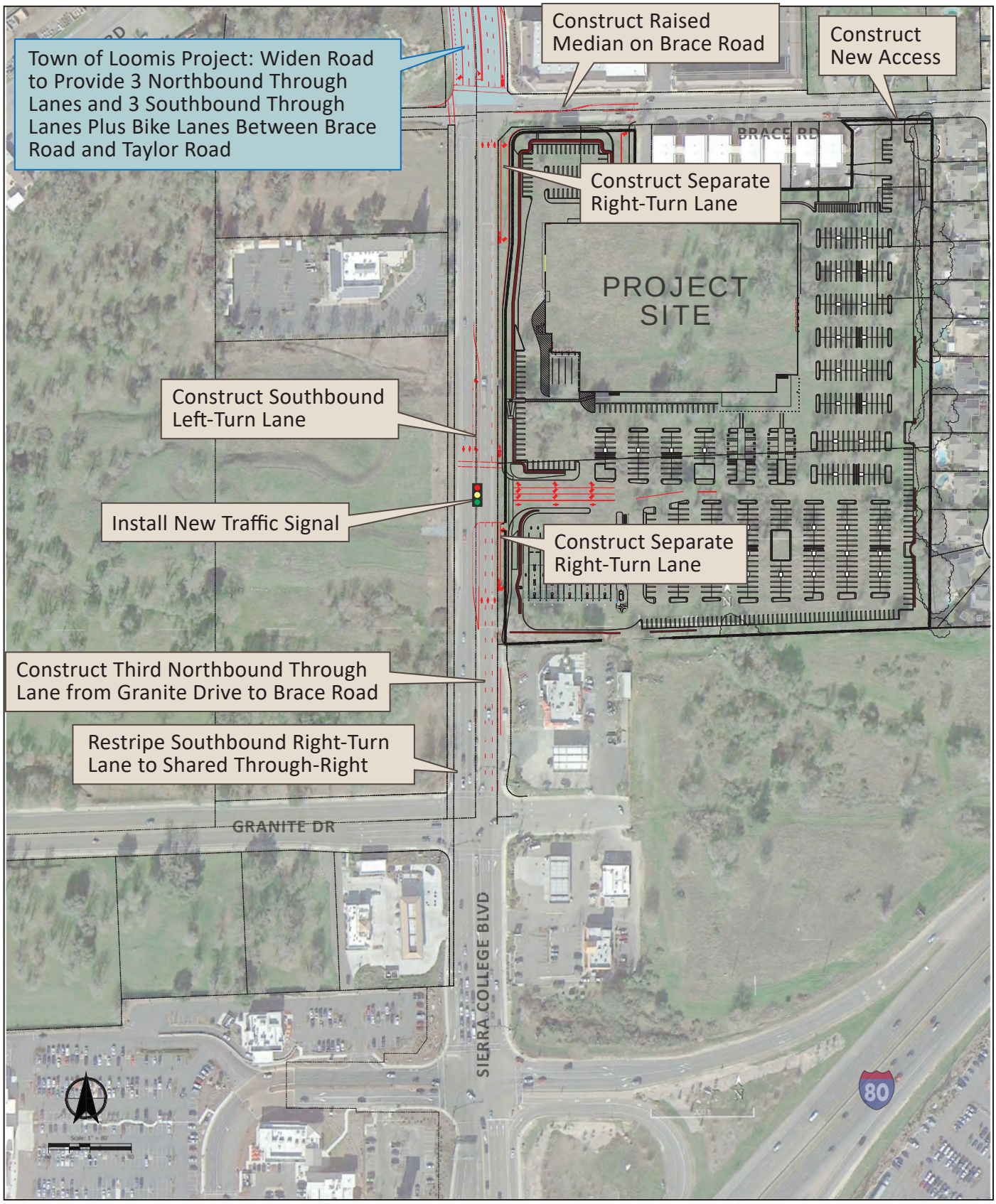
- Project Driveway Option 1A (proposed Project site plan)
- Project Driveway Option 1B, which includes:
  - A new signalized intersection along Sierra College Boulevard (same as Option 1A);
  - A right-in/right-out only driveway on Brace Road (same as Option 1A); and
  - A shared drive aisle connection to Granite Drive.
- Project Driveway Option 1C: this option includes the same access as Option 1A plus a shared drive aisle connection to Granite Drive.

In conjunction with site development, Costco would provide right-of-way dedications and widen Sierra College Boulevard along the Project site frontage, activating a third northbound travel lane between Granite Drive and Brace Road. Separate northbound right-turn lanes would be constructed on Sierra College Boulevard at the new signalized Costco access and at Brace Road. The new signalized entry on Sierra College Boulevard would be designed to accommodate a potential fourth approach to serve future Rocklin development on the vacant lot across Sierra College Boulevard to the west.

For the Project access scenarios involving a connection to Granite Drive, Costco would reconfigure Granite Drive east of Sierra College Boulevard to provide side-by-side eastbound and westbound left-turn lanes on Granite Drive (separated by a raised median) between Sierra College Boulevard and the new north-south drive aisle connecting to the Project site.

Figure EX-1 illustrates the proposed site driveway locations and summarizes key planned transportation infrastructure serving the site. In addition to the recommended improvements to be constructed by Costco described above and shown in Figure EX-1, the Town of Loomis will be separately completing widening of Sierra College Boulevard to three lanes northbound and three lanes southbound between Brace Road and Taylor Road as part of a funded Capital Improvement Plan project. The Sierra College Boulevard widening by the Town north of Brace Road is expected to be completed prior to opening of the Costco.

Based on the analysis methodology and significance criteria approved by the Town, Table A lists the study intersections performing at unacceptable level-of-service (LOS) as well as locations impacted by the Project. Table B lists the study intersections where queues extend beyond the available storage lengths as well as locations impacted by the Project. Table C lists the specific project mitigation measures.



Proposed Costco Transportation Improvements
Loomis, CA

Figure
EX-1

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KITTELSON & ASSOCIATES

Table A: Study Area Intersection LOS Results Summary

ID	Intersection	Jurisdiction	Existing Conditions				Cumulative Short Term Conditions				Cumulative Long Term Conditions			
			Unacceptable LOS?		Project Impact?	Significance after Mitigation?	Unacceptable LOS?		Project Impact?	Significance after Mitigation?	Unacceptable LOS?		Project Impact?	Significance after Mitigation?
			Existing	Existing + Project			Short Term	Short Term + Project			Long Term	Long Term + Project		
1	Taylor Road & King Road	Loomis	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
2	Taylor Road & Horseshoe Bar Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
3	Horseshoe Bar Road & I-80 Westbound Ramp	Caltrans	-	-	-	-	-	-	-	-	-	-	-	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
5	Barton Road & Brace Road	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
6	Sierra College Boulevard & Taylor Road	Loomis	Yes	Yes	-	-	Yes	Yes	Yes	LTS	Yes	Yes	Yes	LTS
7	Sierra College Boulevard & Brace Road	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
8	Sierra College Boulevard & Granite Drive	Rocklin	-	-	-	-	Yes	Yes	Yes	SU	Yes	Yes	Yes[1]	SU
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	-	-	-	-	-	Yes	Yes	SU	-	-	-	-
10	Sierra College Boulevard & I-80 Eastbound Ramps	Caltrans	-	-	-	-	-	-	-	-	-	-	-	-
11	Sierra College Boulevard & Schriber Way	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
12	Sierra College Boulevard & Bass Pro Drive-Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	Yes	SU
13	Sierra College Boulevard & Stadium Driveway	Rocklin	-	-	-	-	-	-	-	-	-	-	-	-
14	Sierra College Boulevard & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
15	Pacific Street & Dominguez Road-Delmar Avenue	Rocklin	Yes	Yes	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
16	Pacific Street & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
17	Granite Drive & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
18	I-80 Westbound Ramps & Rocklin Road	Caltrans	-	-	-	-	-	-	-	-	Yes	Yes	-	-
19	I-80 Eastbound Ramps & Rocklin Road	Caltrans	-	-	-	-	-	-	-	-	Yes	Yes	-	-
20	Aguilar Road & Rocklin Road	Rocklin	-	-	-	-	-	-	-	-	-	-	-	-
21	Sierra College Boulevard & Driveway South of Brace Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
22	Granite Drive & Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
23	El Don Drive & Rocklin Road	Rocklin	Yes	Yes	-	-	-	-	-	-	Yes	Yes	-	-
24	Sierra College Boulevard & Project Driveway – Future West Access by	Loomis	DNE	-	-	-	DNE	-	-	-	Yes	-	-	-
25	Brace Road & Project Driveway	Loomis	DNE	-	-	-	DNE	-	-	-	DNE	-	-	-
26	Sierra College Boulevard & SR-193	Placer	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
27	Sierra College Boulevard & English Colony Way	Placer	-	-	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
28	Sierra College Boulevard & Delmar Avenue	Placer	Yes	Yes	-	-	Yes	Yes	-	-	-	-	-	-
29	Taylor Road & English Colony Way	Placer	-	-	-	-	-	Yes	Yes	SU	Yes	Yes	-	-
30	Taylor Road & Penryn Road (North)	Placer	-	-	-	-	-	-	-	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	Placer	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	-	-	-	-
32	Taylor Road & Del Oro High School North Lot	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
33	Taylor Road & Del Oro High School Drop-Off	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
34	Taylor Road & Del Oro High School South Lot	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
35	Taylor Road & Rippey Road	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
36	Taylor Road & Webb Street	Loomis	Yes	Yes	Yes	SU	Yes	Yes	Yes	LTS	Yes	Yes	Yes	LTS
37	Brace Road & Project Driveway East	Loomis	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Project Impacts apply to all Project Driveway Options unless otherwise noted: 1: Under Project Driveway Option 1A only. 2: Under Project Driveway Option 1B only. 3: Under Project Driveway Option 1C only.

SU: Significant and Unavoidable Impact. LTS: Less Than Significant Impact DNE: Intersection does not exist under no Project conditions.

Source: Kittelson & Associates, 2019

Table B: Study Area Queuing Results Summary

ID	Intersection	Jurisdiction	Existing Conditions				Cumulative Short Term Conditions				Cumulative Long Term Conditions			
			95th Percentile Queue>Storage?		Project Impact?	Significance after Mitigation?	95th Percentile Queue>Storage?		Project Impact?	Significance after Mitigation?	95th Percentile Queue>Storage?		Project Impact?	Significance after Mitigation?
			Existing	Existing + Project			Short Term	Short Term + Project			Long Term	Long Term + Project		
1	Taylor Road & King Road	Loomis	Yes	Yes	Yes	LTS	Yes	Yes	-	-	Yes	Yes	Yes	LTS
2	Taylor Road & Horseshoe Bar Road	Loomis	Yes	Yes	-	-	Yes	Yes	Yes	SU	Yes	Yes	Yes	LTS
3	Horseshoe Bar Road & I-80 Westbound Ramp	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	Caltrans	-	-	-	-	-	-	-	-	Yes	Yes	-	-
5	Barton Road & Brace Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
6	Sierra College Boulevard & Taylor Road	Loomis	Yes	Yes	-	-	Yes	Yes	Yes	LTS	Yes	Yes	Yes	LTS
7	Sierra College Boulevard & Brace Road	Loomis	-	Yes	Yes[2]	LTS	Yes	Yes	Yes[2]	LTS	Yes	Yes	Yes[2]	LTS
8	Sierra College Boulevard & Granite Drive	Rocklin	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
10	Sierra College Boulevard & I-80 Eastbound Ramps	Caltrans	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
11	Sierra College Boulevard & Schriber Way	Rocklin	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
12	Sierra College Boulevard & Bass Pro Drive-Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
13	Sierra College Boulevard & Stadium Driveway	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
14	Sierra College Boulevard & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
15	Pacific Street & Dominguez Road-Delmar Avenue	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
16	Pacific Street & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
17	Granite Drive & Rocklin Road	Rocklin	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
18	I-80 Westbound Ramps & Rocklin Road	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
19	I-80 Eastbound Ramps & Rocklin Road	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
20	Aguilar Road & Rocklin Road	Rocklin	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
21	Sierra College Boulevard & Driveway South of Brace Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
22	Granite Drive & Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
23	El Don Drive & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
24	S Sierra College Boulevard & Project Driveway – Future West Access by Others	Loomis	DNE	-	-	-	DNE	Yes	Yes	LTS	Yes	Yes	Yes	LTS
25	Brace Road & Project Driveway	Loomis	DNE	-	-	-	DNE	-	-	-	DNE	-	-	-
26	Sierra College Boulevard & SR-193	Placer	-	-	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
27	Sierra College Boulevard & English Colony Way	Placer	-	-	-	-	-	-	-	-	Yes	Yes	-	-
28	Sierra College Boulevard & Delmar Avenue	Placer	-	-	-	-	-	-	-	-	-	-	-	-
29	Taylor Road & English Colony Way	Placer	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
30	Taylor Road & Penryn Road (North)	Placer	-	-	-	-	-	-	-	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	Placer	-	-	-	-	-	-	-	-	Yes	Yes	-	-
32	Taylor Road & Del Oro High School North Lot	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
33	Taylor Road & Del Oro High School Drop-Off	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
34	Taylor Road & Del Oro High School South Lot	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
35	Taylor Road & Rippey Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
36	Taylor Road & Webb Street	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
37	Brace Road & Project Driveway East	Loomis	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Project Impacts apply to all Project Driveway Options unless otherwise noted: 1: Under Project Driveway Option 1A only. 2: Under Project Driveway Option 1B only. 3: Under Project Driveway Option 1C only.

SU: Significant and Unavoidable Impact. LTS: Less Than Significant Impact DNE: Intersection does not exist under no Project conditions.

Source: Kittelson & Associates, 2019

Table C: Proposed Mitigation Measure Summary

Intersection	Project Driveway Option(s) Requiring Mitigation	Type of Impact	Jurisdiction	Mitigation Measure	Significance After Mitigation
Existing plus Project Conditions					
1: Taylor Road & King Road	Options 1A, 1B, 1C	Queue (WBL)	Loomis	TR MM 1: Modify signal timing	Less than significant
7: Sierra College Boulevard & Brace Road	Option 1B	Queue (WBL)	Loomis	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Less than significant
8: Sierra College Boulevard & Granite Drive	Option 1A	Queue (NBT, SBT, EBL)	Rocklin	TR MM 1: Modify signal timing TR MM 4: Restripe intersection	Significant unavoidable*
8: Sierra College Boulevard & Granite Drive	Options 1B, 1C	Queue (WBL)	Rocklin	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Significant unavoidable*
9: Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	Queue (SBT)	Caltrans	TR MM 1: Modify signal timing	Significant unavoidable*
17: Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Queue (EBL)	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
26: Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
31: Taylor Road & Penryn Road (South)	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
36: Taylor Road & Webb Street	Options 1A, 1B, 1C	LOS	Loomis	TR MM 4: Restripe intersection	Significant unavoidable[1]
Cumulative Short Term plus Project Conditions					
2: Taylor Road & Horseshoe Bar Road	Options 1A, 1B, 1C	Queue (NBT, SBT)	Loomis	TR MM 1: Modify signal timing	Significant unavoidable[2]
6: Sierra College Boulevard & Taylor Road	Options 1A, 1B, 1C	LOS	Loomis	TR MM 1: Modify signal timing TR MM 3: Modify signal phasing TR MM 7: Add storage to turn pockets	Less than significant
		Queue (NBL, WBL)			Less than significant
7: Sierra College Boulevard & Brace Road	Option 1B	Queue (SBL, WBL)	Loomis	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Less than significant
8: Sierra College Boulevard & Granite Drive	Option 1A	Queue (NBT, SBT, EBL)	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe intersection	Significant unavoidable*

Intersection	Project Driveway Option(s) Requiring Mitigation	Type of Impact	Jurisdiction	Mitigation Measure	Significance After Mitigation
8: Sierra College Boulevard & Granite Drive	Options 1B, 1C	LOS	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Significant unavoidable*
		Queue (NBT, SBT, EBL, WBL)			Significant unavoidable*
9: Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	LOS	Caltrans	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Significant unavoidable*
		Queue (SBT)			Significant unavoidable*
15: Pacific Street & Dominguez Road-Delmar Avenue	Options 1A, 1B, 1C	LOS	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
17: Granite Drive & Rocklin Road	Options 1A, 1B, 1C	LOS/Queue (EBL)	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
24: Sierra College Boulevard & Project Driveway	Option 1A	Queue (SBL)	Loomis	TR MM 1: Modify signal timing	Less than significant
26: Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	LOS/Queue (NBR)	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
27: Sierra College Boulevard & English Colony Way	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
29: Taylor Road & English Colony Way	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
31: Taylor Road & Penryn Road (South)	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
36: Taylor Road & Webb Street	Options 1A, 1B, 1C	LOS	Loomis	TR MM 4: Restripe Intersection	Less than significant
Cumulative Long Term plus Project Conditions					
1: Taylor Road & King Road	Options 1A, 1B, 1C	Queue (WBL)	Loomis	TR MM 1: Modify signal timing	Less than significant
2: Taylor Road & Horseshoe Bar Road	Options 1A, 1B, 1C	Queue (NBT)	Loomis	TR MM 1: Modify signal timing	Less than significant
6: Sierra College Boulevard & Taylor Road	Options 1A, 1B, 1C	LOS	Loomis	TR MM 1: Modify signal timing TR MM 3: Modify signal phasing	Less than significant
		Queue (NBL, WBL)			Less than significant
7: Sierra College Boulevard & Brace Road	Option 1B	Queue (SBL, WBL)	Loomis	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Less than significant
8: Sierra College Boulevard & Granite Drive	Option 1A	LOS	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Significant unavoidable*
		Queue (NBT, SBT, EBL)			

Intersection	Project Driveway Option(s) Requiring Mitigation	Type of Impact	Jurisdiction	Mitigation Measure	Significance After Mitigation
8: Sierra College Boulevard & Granite Drive	Options 1B, 1C	Queue (NBT, SBT, WBL)	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Significant unavoidable*
9: Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	Queue (SBT)	Caltrans	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Significant unavoidable[3]
17: Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Queue (EBL)	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
24: Sierra College Boulevard & Project Driveway	Option 1A	Queue (SBL)	Loomis	TR MM 2: Provide signal coordination	Less than significant
24: Sierra College Boulevard & Project Driveway	Options 1B, 1C	Queue (SBL)	Loomis	TR MM 7: Add storage to turn pockets	Less than significant
26: Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	LOS	Placer	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Significant unavoidable*
36: Taylor Road & Webb Street	Options 1A, 1B, 1C	LOS	Loomis	TR MM 4: Restripe Intersection	Less than significant

Notes:
NB: northbound, SB: southbound, EB: eastbound, WD: westbound, L: left turn lane, T: through lane, R: right turn lane
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures may be deemed infeasible or outside of the lead agency jurisdiction to implement.
[1]Temporary impact given this impact can be mitigated with the westbound right-turn mitigation measure under Short Term and Long Term conditions. Traffic volumes projected at intersection do not meet signal traffic warrants.

[2]The proposed mitigation does not reduce queues to No Project Conditions and additional geometric improvements are not feasible due to site constraints.

[3] The impact could not be mitigated to less than significant levels. A fourth southbound through lane may be needed to accommodate traffic volumes. The mitigation measures may be deemed infeasible or outside of the lead agency jurisdiction to implement.
Source: Kittelson & Associates, Inc. 2019

Section 1
Introduction

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Project proposes an approximately 155,000 square foot warehouse with a tire center and a Costco Gasoline fuel station with up to 30 fueling positions. The approximately 17.4-acre site would provide 778 parking stalls, including 16 accessible stalls. The proposed site plan exceeds the Town's minimum parking requirement of five stalls per thousand square feet (765 spaces). Bike parking would also be provided consistent with City requirements.

Proposed Site Access

The proposed Project site plan provides access to the site at three locations:

- A proposed new Project signalized intersection along Sierra College Boulevard;
- A right-in/right-out only Project driveway on Brace Road located approximately 215 feet east of Sierra College Boulevard (measured curb-to-curb); and
- A full access Project driveway on Brace Road located approximately 675 feet east of Sierra College Boulevard (measured curb-to-curb). This new access would be shared with an existing apartment building located to the west. Starlight Lane would be closed and vacated.

All Project access points would be available to Costco members. The right-in/right-out only Brace Road driveway would also serve entering warehouse delivery trucks. Warehouse deliver trucks would exit the site at the new Project signalized intersection on Sierra College Boulevard. Costco Gasoline fuel station delivery vehicles would enter and exit the Project site at the proposed new Project signalized intersection on Sierra College Boulevard.

Alternative Site Access

In addition to analyzing the traffic impacts associated with the proposed site access, study intersection traffic operations are documented in this report for two alternative site access options for comparison purposes. For ease of identification, the access options will be referenced in this report as follows:

- Project Driveway Option 1A (proposed Project site plan)
- Project Driveway Option 1B which includes:
  - A new signalized intersection along Sierra College Boulevard (same as Option 1A);
  - A right-in/right-out only driveway on Brace Road (same as Option 1A); and
  - A shared drive aisle connection to Granite Drive.
- Project Driveway Option 1C: this option includes the same access as Option 1A plus a shared drive aisle connection to Granite Drive.

Supporting Transportation Infrastructure Provided by Project

Transportation infrastructure to be constructed by Costco in conjunction with site development includes:

- Widening Sierra College Boulevard along the Project site frontage to provide three northbound travel lanes and a Class II northbound bicycle facility
- Separate northbound right-turn lanes on Sierra College Boulevard at the new signalized Costco access and at Brace Road, including overlap traffic signals at both locations
- A new Project site signalized entry on Sierra College Boulevard that is designed to accommodate a potential fourth approach to serve future development by others on the vacant lot across Sierra College Boulevard to the west as well a dedicated southbound left turn lane
- Provide traffic signal interconnect between the proposed new Costco site access signalized intersection and the adjacent intersections along Sierra College Boulevard at Brace Road and Granite Drive Dedicate right-of-way and construct standard half-street improvements along the Brace Road site frontage
- Install a raised median on Brace Road between Sierra College Boulevard and the existing Homewood Lumber driveway to the east to limit Costco access to right-turns only
- Provide a left turn pocket or stripe a two-way left turn median along Brace Road

As previously noted, Project Driveway Options 1B and 1C additionally will assume construction of a driveway access through Granite Drive. The access would provide a drive aisle connection to the anticipated future shopping center to be located on the eastern terminus of Granite Drive. With the Project driveway on Granite Drive in Options 1B and 1C, the Project would also restripe the existing northbound right-turn travel lane on Sierra College Boulevard at Granite Drive to a shared through/right lane.

1.2 SCOPE OF THE REPORT

This analysis determines the transportation-related impacts associated with the proposed Costco Warehouse and was prepared in accordance with the Town of Loomis (Town) and California Transportation Department's (Caltrans) requirements for traffic impact studies. The study intersections and scope of this Project were selected based on scoping direction from the Town of Loomis (Town) in consultation with City of Rocklin (City), Placer County (County) and Caltrans staff.

Per the Town's requirements, the study includes analysis for the following scenarios:

- Existing Conditions
- Existing plus Project Conditions
- Cumulative Baseline Conditions (Short Term and Long Term)
- Cumulative plus Project Conditions (Short Term and Long Term)

Section 2
Regulatory Setting

2.0 REGULATORY SETTING

The following section outlines State and local regulations related to transportation and traffic. Intersection performance measures reported in this study include level of service (LOS) and delay. Transportation system operations were compared to applicable significance criteria for the Town, City, County and Caltrans. The sections below summarize each of the respective agency standards as well California Environmental Quality Act standards (CEQA). LOS operating goals for each jurisdiction are applied to study locations owned by that jurisdiction.

2.1 TOWN OF LOOMIS SIGNIFICANCE CRITERIA

The Town of Loomis General Plan Circulation Element (2016) specifies minimum LOS standards for all streets and intersections within Loomis, as follows:

> Level of Service policy: In order to minimize congestion, maintain LOS C on all roads and intersections within the Town of Loomis. LOS D may be allowed in conjunction with development approved within the Town as an exception to this standard, at the intersections of King and Taylor, Horseshoe Bar Road and Taylor, Horseshoe Bar Road and I-80, and Sierra College and Brace Road, when:
>
> 1. The deficiency is substantially caused by “through” traffic, which neither begins nor ends in Loomis, and is primarily generated by non-residents; or
>
> 2. The deficiency will be temporary (less than three years), and a fully-funded plan is in place to provide the improvements needed to remedy the substandard condition.

2.2 CITY OF ROCKLIN SIGNIFICANCE CRITERIA

The City of Rocklin General Plan Circulation Element (2012) states the following:

A. Maintain a minimum traffic LOS C for all signalized intersections during the PM peak hour on an average weekday, except in the circumstances described below.

B. Recognizing that some signalized intersections within the City serve and are impacted by development located in adjacent jurisdictions, and that these impacts are outside the control of the City, a development project which is determined to result in a LOS worse than “C” may be approved, if the approving body finds (1) the diminished LOS is an interim situation which will be alleviated by the implementation of planned improvements or (2) based on the specific circumstances described in Section C. below, there are no feasible street improvements that will improve the LOS to “C” or better as set forward in the Action Plan for the Circulation Element.

C. All development in another jurisdiction outside of Rocklin's control which creates traffic impacts in Rocklin should be required to construct all mitigation necessary in order to maintain a LOS C in Rocklin unless the mitigation is determined to be infeasible by the Rocklin City Council. The standard for determining the feasibility of the mitigation would be whether or not the improvements create unusual economic, legal, social, technological, physical or other similar burdens and considerations".

2.3 PLACER COUNTY SIGNIFICANCE CRITERIA

The Placer County General Plan identifies Policies presenting significance criteria, including the following:

- Policy 3.A.7: The County shall develop and manage its roadway system to maintain the following minimum LOS.
  - LOS C on rural roadways, except within one-half mile of state highways where the standard shall be LOS D.
  - LOS C on urban/suburban roadways except within one-half mile of state highways where the standard shall be LOS D.

The County may allow exceptions to these level of service standards where it finds that the improvements or other measures required to achieve the LOS standards are unacceptable based on established criteria. In allowing any exception to the standards, the County shall consider the following factors:

- The number of hours per day that the intersection or roadway segment would operate at conditions worse than the standard.
- The ability of the required improvement to significantly reduce peak hour delay and improve traffic operations.
- The right-of-way needs and the physical impacts on surrounding properties.
- The visual aesthetics of the required improvement and its impact on community identity and character.
- Environmental impacts including air quality and noise impacts.
- Construction and right-of-way acquisition costs.
- The impacts on general safety.
- The impacts of the required construction phasing and traffic maintenance.
- The impacts on quality of life as perceived by residents.
- Consideration of other environmental, social, or economic factors on which the County may base findings to allow an exceedance of the standards.

Exceptions to the standards will only be allowed after all feasible measures and options are explored, including alternative forms of transportation.

Specific methodology is provided in the Impact Analysis Methodology of Assessment Memorandum prepared September 30th, 2015 as outlined below:

Signalized Intersection Assessment Methodology:

A project may be considered to exceed minimum LOS policies if;

- An intersection operating at or above the established Placer County policies without the project traffic trips will decrease to an unacceptable LOS with the project; or
- An intersection currently operating below the established acceptable LOS policy will experience an increase in overall average intersection delay of 4 seconds or greater.

Unsignalized Intersection Assessment Methodology:

A project may be considered to exceed minimum LOS policies if;

- An all way stop or side street controlled intersection, which currently operates at or above the established Placer County policies without the project, will deteriorate to an unacceptable LOS with the project and cause the intersection to meet MUTCD traffic sign warrant(s); or
- An all way stop or side street controlled intersection which currently operates below the established acceptable LOS policy and meets MUTCD signal warrant(s) will experience an increase of 2.5 seconds or more with the project.

Further consideration will be given in situations where the existing level of service is just above or at the approved minimum level of service and any increase in vehicle trips, or even daily fluctuations in traffic, will deteriorate the level of service to an unacceptable level.

Based on review of Placer County roadway segment analysis in the approved Bickford Ranch EIR[1], roadway segment impacts would be considered in conjunction with intersection performance along the corridor. Specific methodology outlined in the Impact Analysis Methodology of Assessment Memorandum prepared September 30th, 2015 states:

A project may be considered to exceed minimum LOS policies (as defined by Policy 3.A.7 as outlined above) if;

- A roadway segment operating at or above the established Placer County policies without the project traffic trips will decrease to an unacceptable LOS with the project; or
- A roadway segment currently operating below the established acceptable LOS policy will experience an increase in volume to capacity (V/C) ratio of 0.05 or greater with the project; or
- A roadway segment currently operating below the established acceptable LOS policy will experience an increase in Average Daily Traffic (ADT) of 100 or more project generated trips, per lane.

[1] Addendum to the Bickford Ranch Specific Plan Environmental Impact Report. October 13, 2015.

2.4 CALTRANS SIGNIFICANCE CRITERIA

Per the Caltrans Guide for the Preparation of Traffic Impact Studies (December 2002), Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D (see Appendix "C-3") on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. Based on conversations with the Town of Loomis staff, it was determined that the target LOS for State highway facilities for the purposes of this project is LOS D. If an existing State highway facility is operating at less than the appropriate target LOS (LOS D), the existing measures of effectives (MOE) should be maintained.

Caltrans staff were contacted to confirm operating requirements for study intersection assessment purposes as noted above. Caltrans District 3 Forecasting and Operations staff identified a LOS E target standard for the Sierra College Boulevard ramp terminals with I-80[2].

2.5 CEQA SIGNIFICANCE CRITERIA

Based on Appendix G of the CEQA Guidelines, the project would have a significant transportation impact if it would do the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of performance of the circulation system, taking into account all modes of transportation relevant components of the circulation system
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise materially decrease the performance or safety of such facilities
- Result in inadequate emergency access
- Substantially increase hazards due to a design feature (such as sharp curves or dangerous intersections) or incompatible uses (such as farm equipment)

[2] Source: November 14, 2018 correspondence from David Smith, Associate Transportation Planner, Transportation Planning – North, Caltrans District 3

2.6 SIGNIFICANT IMPACT

2.6.1 Intersection Delay and Level of Service

Based on direction provided by the lead jurisdiction, Town of Loomis, an intersection is considered significantly impacted as follows:

- At signalized intersections, if project trips cause intersection LOS to change from acceptable to unacceptable levels or if the intersection is already operating at unacceptable LOS, and the project trips cause the average intersection delay to increase by 5.0 seconds or more, then the impact is significant.
- At unsignalized intersections, if project trips cause intersection LOS to change from acceptable to unacceptable levels or if the intersection is already failing, and the project adds trips to the intersection exceeding 5% of the total traffic already at the intersection, then the impact is significant.

This criteria is applied to study locations within the Town of Loomis as well as for jurisdictions where an incremental delay-based impact is not established. Based on the guidelines from each jurisdiction above, Table 1 lists the study intersections, the responsible jurisdiction, and the corresponding operating standard.

Table 1: Study Intersections & Applicable Operating Standards

ID	Street Name		Jurisdiction	LOS Operating Goal	Significant Impact Threshold
	North-South	East-West			
1	Taylor Rd	King Rd	Loomis	D	LOS E/F or 5.0 seconds + added[1]
2	Taylor Rd	Horseshoe Bar Rd	Loomis	D	LOS E/F or 5.0 seconds + added [1]
3	Horseshoe Bar Rd	I-80 WB Ramp	Caltrans	D	LOS E/F or 5.0 seconds + added [1]
4	Horseshoe Bar Rd	I-80 EB Ramp	Caltrans	D	LOS E/F or 5% Project Trips
5	Barton Rd	Brace Rd	Loomis	C	LOS D/E/F or 5% Project Trips
6	Sierra College Blvd	Taylor Rd	Loomis	C	LOS D/E/F or 5.0 seconds + added [1]
7	Sierra College Blvd	Brace Rd	Loomis	D	LOS E/F or 5.0 seconds + added [1]
8	Sierra College Blvd	Granite Dr	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
9	Sierra College Blvd	I-80 WB Ramps	Caltrans	E[2]	5.0 seconds + added [1]
10	Sierra College Blvd	I-80 EB Ramps	Caltrans	E[2]	5.0 seconds + added [1]
11	Sierra College Blvd	Schriber Way	Rocklin	C[3]	Stop control: LOS D/E/F or 5% Project[4]; Signal control: LOS D/E/F or 5.0 seconds + added [1]
12	Sierra College Blvd	Bass Pro Dr/Dominguez Rd	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
13	Sierra College Blvd	Stadium Dwy	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
14	Sierra College Blvd	Rocklin Rd	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
15	Pacific St	Dominguez Rd/Delmar Ave	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
16	Pacific St	Rocklin Rd	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
17	Granite Dr	Rocklin Rd	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
18	I-80 WB Ramps	Rocklin Rd	Caltrans	D	LOS E/F or 5.0 seconds + added [1]
19	I-80 EB Ramps	Rocklin Rd	Caltrans	D	LOS E/F or 5.0 seconds + added [1]
20	Aguilar Rd	Rocklin Rd	Rocklin	C	LOS D/E/F or 5.0 seconds + added [1]
21	Sierra College Blvd	Office Dwy S of Brace Rd	Loomis	C	LOS D/E/F or 5% Project Trips
22	Granite Dr	Dominguez Rd	Rocklin	C[3]	Stop control: LOS D/E/F or 5% Project[4]; Signal control: LOS D/E/F or 5.0 seconds + added [1]
23	El Don Rd	Rocklin Rd	Rocklin	C	LOS D/E/F or 5.0 seconds added
24	Sierra College Blvd	Site Access	Loomis	C	LOS D/E/F or 5.0 seconds + added [1]
25	Project Driveway	Brace Rd	Loomis	C	LOS D/E/F or 5% Project Trips[4]
26	Sierra College Blvd	SR-193	Placer	D[3]	Stop control: LOS E/F or 2.5 seconds added & meets warrants[6] Signal control: LOS E/F or 4.0 seconds added[5]
27	Sierra College Blvd	English Colony Way	Placer	C[3]	Stop control: LOS D/E/F or 2.5 seconds added & meets warrants[6] Signal control: LOS E/F or 4.0 seconds added[5]
28	Sierra College Blvd	Delmar Avenue	Placer	C	LOS D/E/F or 2.5 seconds added & meets warrants[6]
29	Taylor Rd	English Colony Way	Placer	C[3]	Stop control: LOS D/E/F or 2.5 seconds added & meets warrants[6] Signal control: LOS E/F or 4.0 seconds added[5]
30	Taylor Rd	Penryn Road (North)	Placer	C	LOS D/E/F or 2.5 seconds added & meets warrants[6]
31	Taylor Rd	Penryn Road (South)	Placer	C	LOS D/E/F or 2.5 seconds added & meets warrants[6]
32	Taylor Rd	Del Oro High School North Lot	Loomis	C	LOS D/E/F or 5% Project Trips
33	Taylor Rd	Del Oro High School Drop-Off	Loomis	C	LOS D/E/F or 5% Project Trips
34	Taylor Rd	Del Oro High School South Lot	Loomis	C	LOS D/E/F or 5% Project Trips
35	Taylor Rd	Rippey Road	Loomis	C	LOS D/E/F or 5% Project Trips
36	Taylor Rd	Webb Street	Loomis	C	LOS D/E/F or 5% Project Trips
37	Project Driveway East	Brace Rd	Loomis	C	LOS D/E/F or 5% Project Trips[4]

Notes:

[1] For signalized intersections, impact is significant if the Project increases delay to unacceptable levels from acceptable levels. Impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project trips cause the average intersection delay to increase by 5.0 seconds or more.

[2]Caltrans direction for acceptable LOS of E at this location.

[3]For existing roadway network configuration the intersection was stop controlled; however, under future conditions the intersection would become signalized and therefore would be evaluated with the signalized intersection threshold.

[4]For unsignalized intersections, impact is significant if the Project increases delay to unacceptable levels from acceptable levels. Impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection.

[5] For signalized intersections, impact is significant if the Project increases delay to unacceptable levels from acceptable levels. Impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project trips cause the average intersection delay to increase by 4.0 seconds or more.

[6]For unsignalized intersections, impact is significant if the Project increases delay to unacceptable levels from acceptable levels and meets MUTCD signal warrants. Impact is significant in situations when the intersection is already operating at unacceptable LOS, meets MUTCD signal warrants, and the Project trips cause the average intersection delay to increase by 2.5 seconds or more.

2.6.2 Intersection Queuing

The Town and neighboring jurisdictions do not have formally-adopted guidelines on queuing analysis methodology or criterion that establishes thresholds of significance for vehicle queues at intersections. For the purposes of this study, a vehicle queue that overflows the available storage for a turn pocket blocking the adjacent travel lane or that queues to an upstream signal blocking through traffic is considered a potential safety hazard and would be considered a significant impact. Therefore, this study identifies a significant impact as occurring at locations where the project traffic would cause the queue length for a turn pocket to overflow its available storage compared to no project conditions or cause a queue to spillback into an upstream signalized intersection. Further, in cases, where the no project queue already overflows the queue storage and the project would contribute 5% of the total traffic for the movement, the impact would be considered significant.

Section 3
Methods of Evaluation

3.0 METHODS OF EVALUATION

The efficiency of traffic operations at a location is measured in terms of vehicular LOS. LOS is the primary unit of measurement for documenting the operating quality of a highway, roadway, or intersection. In general, LOS is measured by the traffic volume-to-capacity (V/C) ratio or by the average delay experienced by vehicles on the facility.

The Highway Capacity Manual 2010 (HCM 2010) (Transportation Research Board, 2010) analysis methodology, as approved by the Town, was applied to all study area intersections as described below. The HCM 2010 is a widely referenced source for the techniques to measure transportation facility performance. Using the HCM 2010 procedures, the quality of traffic operation is graded into one of six LOS designations: A, B, C, D, E, or F, with A representing excellent (free-flow) conditions and F representing extreme congestion. LOS is measured during the course of one peak hour at intersections and on a daily basis on roadway segments.

3.1 LEVEL OF SERVICE METHODOLOGY

At intersections, LOS is defined based on the delay experienced per vehicle. The LOS methodology for signalized intersections accounts for several variables including, but not limited to, the effects of signal type, timing, phasing and progression on average delay. Table 2 defines average delay per vehicle and LOS for signalized intersections.

Table 2: LOS and Average Vehicular Delay Definition for Signalized Intersections

LOS	Delay per Vehicle (seconds)	Definition
A	≤10	LOS A describes operations with a control delay of 10 s/veh or less. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	>10 and ≤20	LOS B describes operations with control delay between 10 and 20 s/veh. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
C	>20 and ≤35	LOS C describes operations with control delay between 20 and 35 s/veh. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	>35 and ≤55	LOS D describes operations with control delay between 35 and 55 s/veh. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	>55 and ≤80	LOS E describes operations with control delay between 55 and 80 s/veh. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	>80	LOS F describes operations with control delay exceeding 80 s/veh. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual 2010 Exhibit 18-4
s/veh: seconds of delay per vehicle

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The LOS for an AWSC intersection is defined by delay for the intersection as a whole, whereas, for a TWSC intersection, LOS is based on the delay for the worst operating movement. Table 3 lists the LOS and delay parameters for unsignalized intersections.

Table 3: LOS and Average Vehicular Delay Definition for Unsignalized Intersections

LOS	Delay per Vehicle (seconds)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Source: Highway Capacity Manual 2010 Exhibit 19-1

Placer County Road Segment Criteria

The Placer County General Plan identifies roadway segment-based traffic volume and LOS evaluation criteria as shown in Table 4.

Table 4: Placer County Evaluation Criteria for Roadway Segment LOS

Roadway Capacity Class	Maximum Daily Traffic Volume Per Lane Levels of Services				
	A	B	C	D	E
Arterial – Moderate Access Control	5,400	6,300	7,200	8,100	9,000

Source: Placer County General Plan Table 4-17 for relevant classifications for County roadways analyzed in this study.

3.2 QUEUING METHODOLOGY

Queues were evaluated at study intersections using the Synchro 9 software and 95th percentile queue lengths were reported to identify locations where the queues may exceed the available storage capacity (queues may be longer during five percent of the peak hour traffic signal cycles). The 95th percentile queue is typically used in traffic engineering as a conservative measure of reporting queuing and because it only has a 5-percent probability of being exceeded, the average driver would likely experience shorter queue lengths than the reported value. As such, the analysis is considered conservative given the reported queues would be less than those experienced by the average driver. Average queues can be found on the Synchro output sheets provided in the appendix.

In addition to assessing queuing with Synchro, queuing along the Sierra College Boulevard corridor was also simulated as discussed further in Section 3.4 of this report.

3.3 FREEWAY MAINLINE

For mainline segments, LOS is measured in terms of density as shown in Table 5 below. Density describes the proximity to other vehicles and is related to the freedom to maneuver within the traffic stream.

Table 5: Level of Service and Density Definition for Basic Freeway Segments

LOS	Density (passenger cars/mile/lane)
A	≤11
B	>11 and ≤18
C	>18 and ≤26
D	>26 and ≤35
E	>35 and ≤45
F	>45 (demand exceeds capacity)

Source: Highway Capacity Manual 2010 Exhibit 11-5

3.4 SUPPLEMENTAL EVALUATIONS

While not required, supplemental analysis is provided per the request of the City and Caltrans to provided additional information as documented below.

3.4.1 Supplemental Simulation Evaluation

A microsimulation analysis was conducted using the SimTraffic software for the Sierra College Boulevard corridor from Taylor Road to Dominguez Road/Bass Pro Drive per Town direction[3]. The analysis was prepared for Existing and Long Term Conditions as requested by the lead agency. The purpose of this microsimulation analysis was to supplement the Synchro analysis.

Neither the lead agency, the Town of Loomis, the City, nor Caltrans have adopted methodology or significance criteria for the simulation evaluation. Therefore, these analyses are not used to evaluate Project impacts and are shown for informational purposes only.

For the purposes of this analysis, seed time was set to 10 minutes and the simulation was recorded for 60 minutes per typical industry practice (seed time represents the time used to load vehicles to the road network prior to measuring performance during the simulation). A total of five simulation runs were prepared for each analysis scenario and the results of all five runs were averaged to obtain the results presented below. The results of each individual run were reviewed to confirm that none of the runs were major outliers that would result in an inaccurate average. Qualitative assessment of simulated existing

[3] The study corridor was extended to include Stadium Way to the south to meter traffic flow into the roadway network.

conditions queueing confirmed that the operating conditions shown in the simulation model represented observed existing field conditions.

3.4.2 Ramp Metering Evaluation

Caltrans requested ramp metering analysis to determine whether future queues from the proposed ramp meter at the I-80 Westbound slip ramp from southbound Sierra College Boulevard would exceed storage and affect operations along the arterial. Ramp metering is currently installed but not activated at the study location. Caltrans was not able to provide ramp metering rates; therefore, a minimum metering rate of 240 vehicles per hour[4] was used as the base rate and adjusted if queues exceeded the available storage capacity of the ramp of approximately 1,200 feet.

The Caltrans Ramp Metering Design Manual (Caltrans, April 2016) arrival discharge chart was used as the basis for a spreadsheet analysis tool to evaluate queues associated with the proposed ramp meter. The ramp metering analysis spreadsheets are set up for three hours of arrival data; however, data is only available for a two-hour period. An adjustment was made to the arrival volumes for the first hour based on the arrival patterns for the two-hour period available data. Additionally, the ramp lanes, an average vehicle length, and the ramp storage length are input for each ramp. Because one of the two southbound to westbound freeway ramp lanes is designed for high occupancy vehicles (HOV) and arrival volumes cannot be differentiated, the assumed lane capacity was reduced to 1.5 lanes in the analysis (the HOV is not metered, however, for this evaluation all vehicles are processed through the meter in 1.5 lanes).

[4] Per Caltrans Ramp Metering Design Manual arrival discharge chart

Section 4
Existing Conditions

4.0 EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of the roadways within the study area. These conditions are compared with future conditions later in this report.

Kittelson & Associates, Inc. (KAI) staff visited and inventoried the proposed development site and surrounding study area, most recently in September 2018. At that time, KAI collected information regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

4.1 SITE CONDITIONS AND ADJACENT LAND USES

The proposed site is within the Town of Loomis, is currently vacant, and is zoned for commercial development. The site is bordered by Sierra College Boulevard to the west and Brace Road to the north. Land uses in the vicinity of the site include residential homes to the north and east, a mix of vacant and developed commercial land to the south, and a mix of vacant land and office space to the west across Sierra College Boulevard.

4.2 TRANSPORTATION FACILITIES

This report section provides an overview of the existing transportation facilities serving the study area. Figure 2 outlines the study intersection locations.

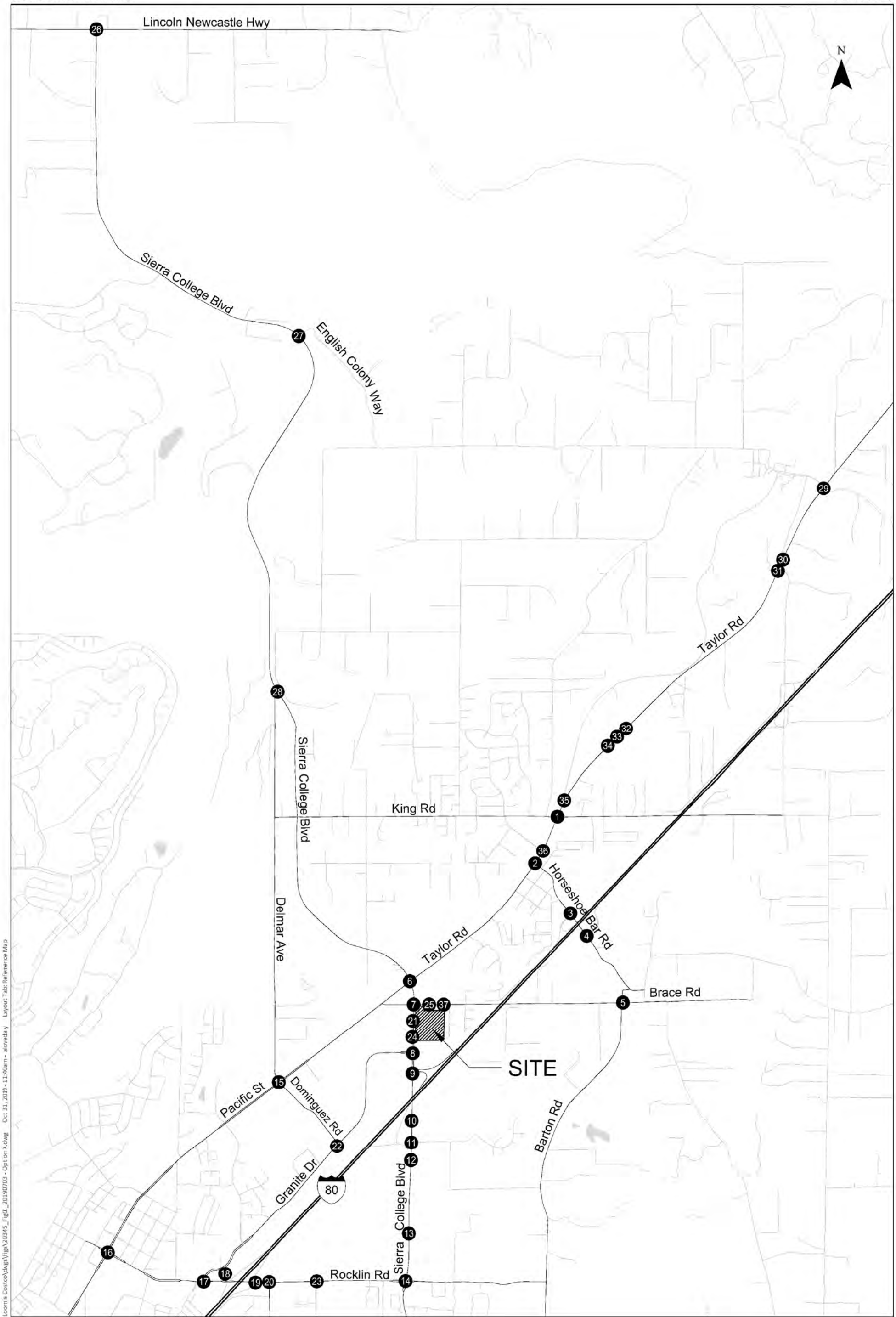
4.2.1 Highway/Roadway Facilities

An overview of key roadway facilities in the study area is provided below.

I-80 – I-80 is an east-west freeway that provides regional access to and through the Project study area. Interchanges along I-80 near the Project site are provided at Rocklin Road, Sierra College Boulevard, and Horseshoe Bar Road. In the study area, I-80 provides three travel lanes in each direction.

Sierra College Boulevard – Sierra College Boulevard is a north-south roadway providing primary access to the Project site. This roadway is classified as an Arterial with an ultimate six-lane cross-section south of Taylor Road in both the Town of Loomis and City of Rocklin General Plan Circulation Elements. Within the study area, Sierra College Boulevard varies from two lanes to a four to five-lane roadway; however, segments near the I-80 ramps are provided with additional travel lanes.

Granite Drive – Granite Drive is a four-lane southwest-northeast roadway located west of I-80. Granite Drive is classified as an arterial in the City of Rocklin's General Plan Circulation Element. Granite Drive connects from Rocklin Road to the south and extends through the Sierra College Boulevard intersection to terminate just east of this roadway.



- Study Intersections

Study Area Network
Loomis, California

Figure
1

KITTELSON & ASSOCIATES

H:\20\20345 - Confidential Loomis Costco\dwgs\Figs\20345_Fig01_20190703 - Option 1.dwg Oct 31, 2019 - 11:40am - aloveday Layout Tab: Reference Map

Taylor Road - Taylor Road is a major arterial street that runs parallel to I-80. Taylor Road is generally a two-lane road through Loomis, but incremental half section widening has occurred in conjunction with private development frontage improvements in some areas.

Horseshoe Bar Road - This arterial street originates at an intersection on Taylor Road in downtown Loomis and continues east past the Project site to an interchange on I-80. Beyond I-80, Horseshoe Bar Road continues for several miles into the rural area of Placer County near Folsom Lake. Horseshoe Bar Road is a two-lane road with auxiliary left turn lanes at major intersections.

Brace Road - Brace Road is a minor street that begins at Taylor Road and continues east over I-80. Brace Road is a two-lane road providing secondary access to the Project site.

4.2.2 Pedestrian and Bicycle Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signals, curb ramps, and streetscape amenities. In general, a network of sidewalks, crosswalks, pedestrian signals, and curb ramps are provided in the vicinity of the proposed Project site; however, significant sidewalk gaps were noted in the study area. Sidewalks are partially provided on Sierra College Boulevard, King Road, Taylor Road, and Horseshoe Bar Road. Crosswalks are provided at all signalized intersections and at a number of other unsignalized locations.

Bicycle paths, lanes and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the following three classes:

Class I – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.

Class II – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.

Class III – Provides a route designated by signs or permanent markings and shared with pedestrians and motorists.

The Town of Loomis developed the 2010 Bicycle Transportation Plan (Figure 2) and the 2010 Trails Master Plan (Figure 3) in an effort to provide the long term framework to improve and encourage the enhancement of the local and regional bikeway and pedestrian network. The existing bicycle system consists of a series of Class I (Multi-Use Paths) and Class II (Bike Lanes).

A Class I bike trail exists on the southeast side of Taylor Road between King Road and Del Oro High School. Also, a Class I bike trail exists on the northwest side of Taylor Road between Circle Drive and Sierra College Boulevard, but lacks connectivity to downtown Loomis. A short portion of King Road east of Bankhead Road also features a Class I bike trail. Class II bike lanes are provided at the following locations:

- Sierra College Boulevard between Granite Drive and Del Mar Avenue,
- Taylor Road between Sierra College Boulevard and Oak Street,
- Taylor Road between Oak Street and Webb Street on the south side only, and
- King Road between Sierra College Boulevard and I-80.

In the study area, the following Class II bike lanes are provided within the City of Rocklin:

- Granite Drive between Sierra College Boulevard and Rocklin Road,
- Rocklin Road from Sierra College Boulevard to I-80 Northbound on/off ramp, and from I-80 Southbound on/off ramp to 5th Street, and
- Pacific Street between Sierra Meadows Drive and E Midas Avenue.

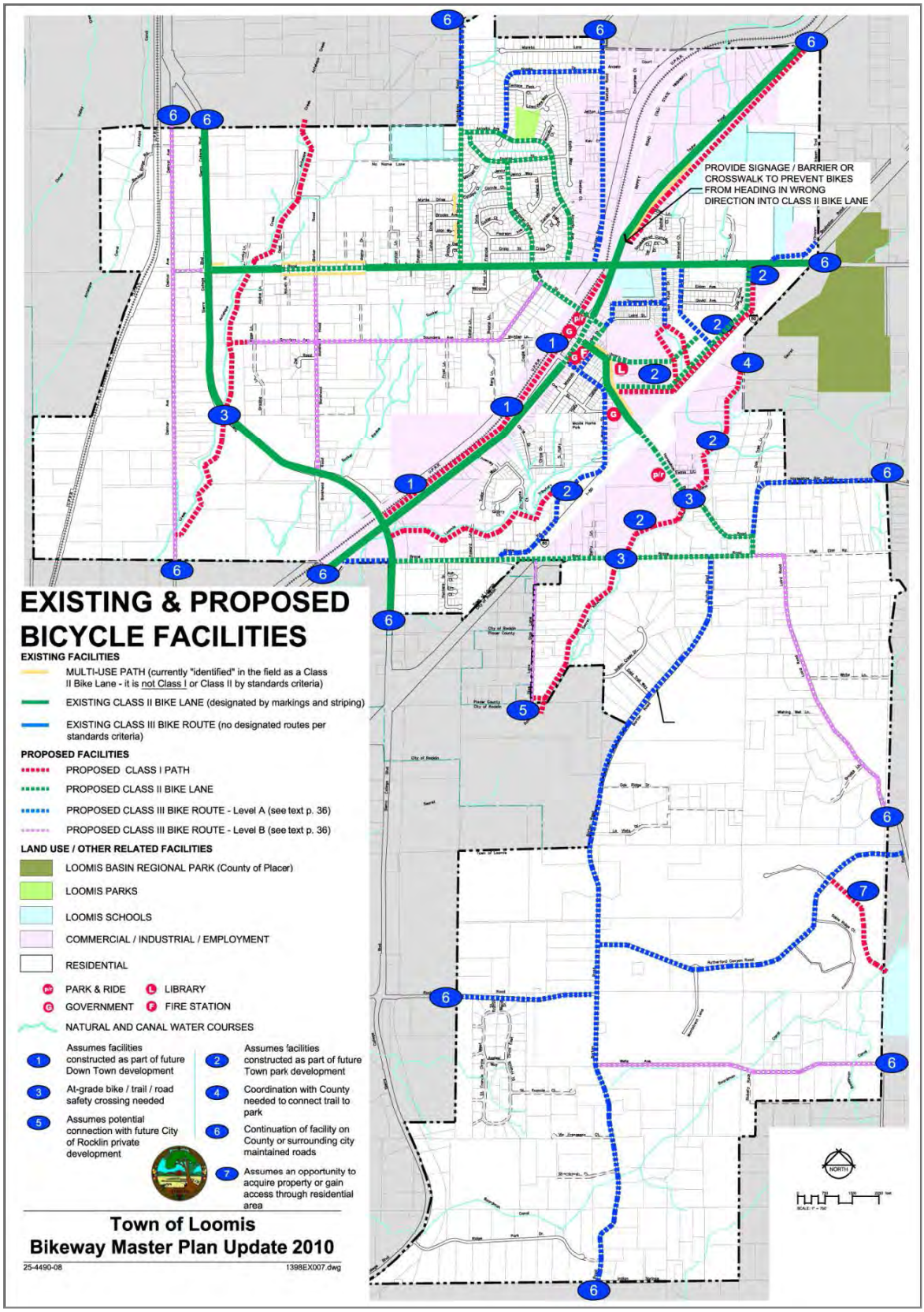


Figure 2: 2010 Bicycle Transportation Plan

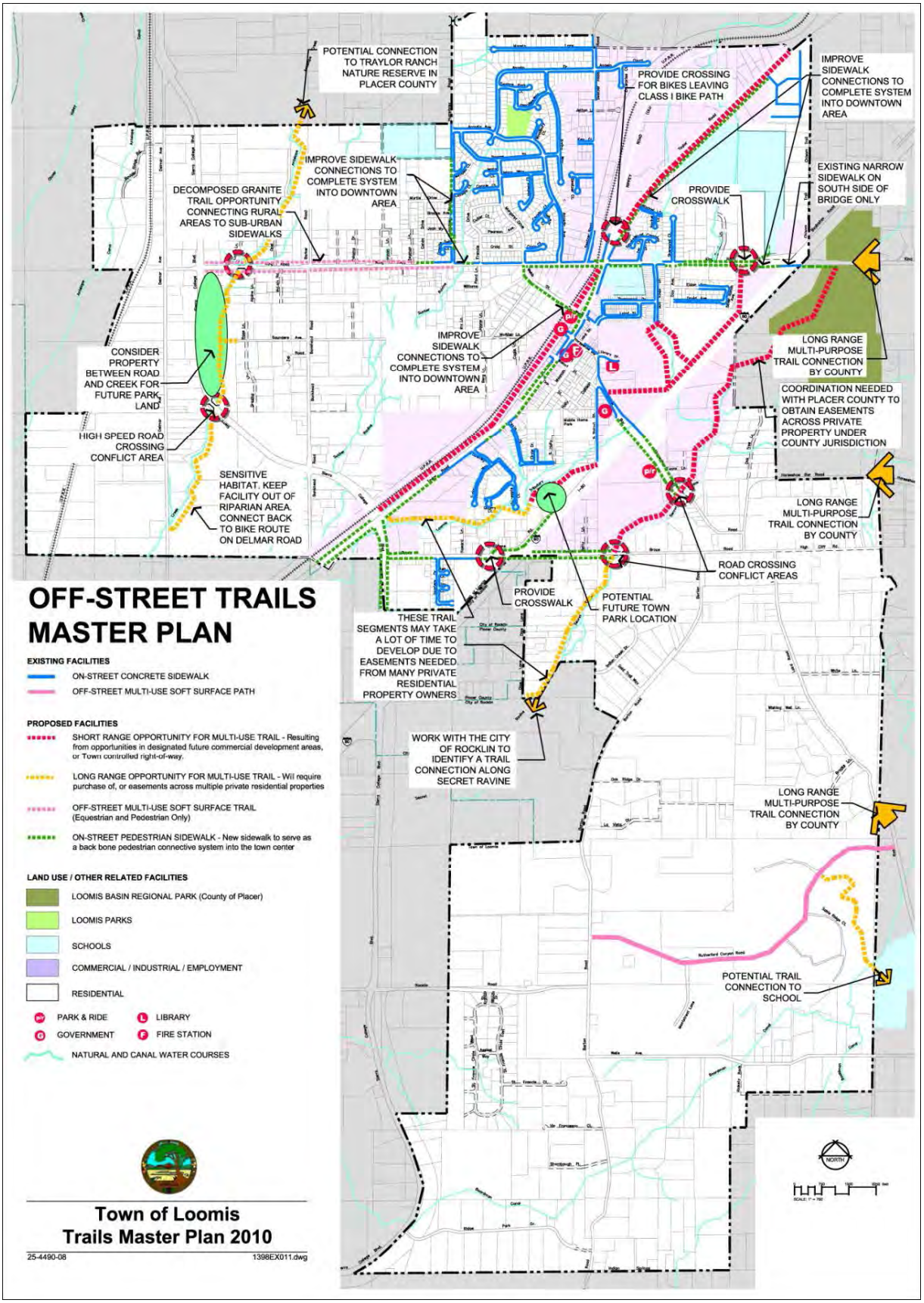


Figure 3: 2010 Trails Master Plan

4.2.3 Transit Facilities

Bus transit service in the Project area is provided by Placer County Transit. Placer County Transit operates local bus routes from Monday to Saturday, with three routes operating in the Project study area. The Auburn to Light Rail Bus Route operates on one hour headways during the morning and afternoon commute periods and stops at the Sierra College Transfer Center. The Lincoln/Sierra College Bus Route operates on one hour headways between Sierra Community College and the City of Lincoln. The Taylor Road Shuttle operates with two hour headways during the morning and afternoon commute periods and travels between Auburn and the Sierra College Transfer center. The Taylor Road Shuttle provides the nearest service to the Project site along Sierra College Boulevard.

4.3 INTERSECTION OPERATIONS

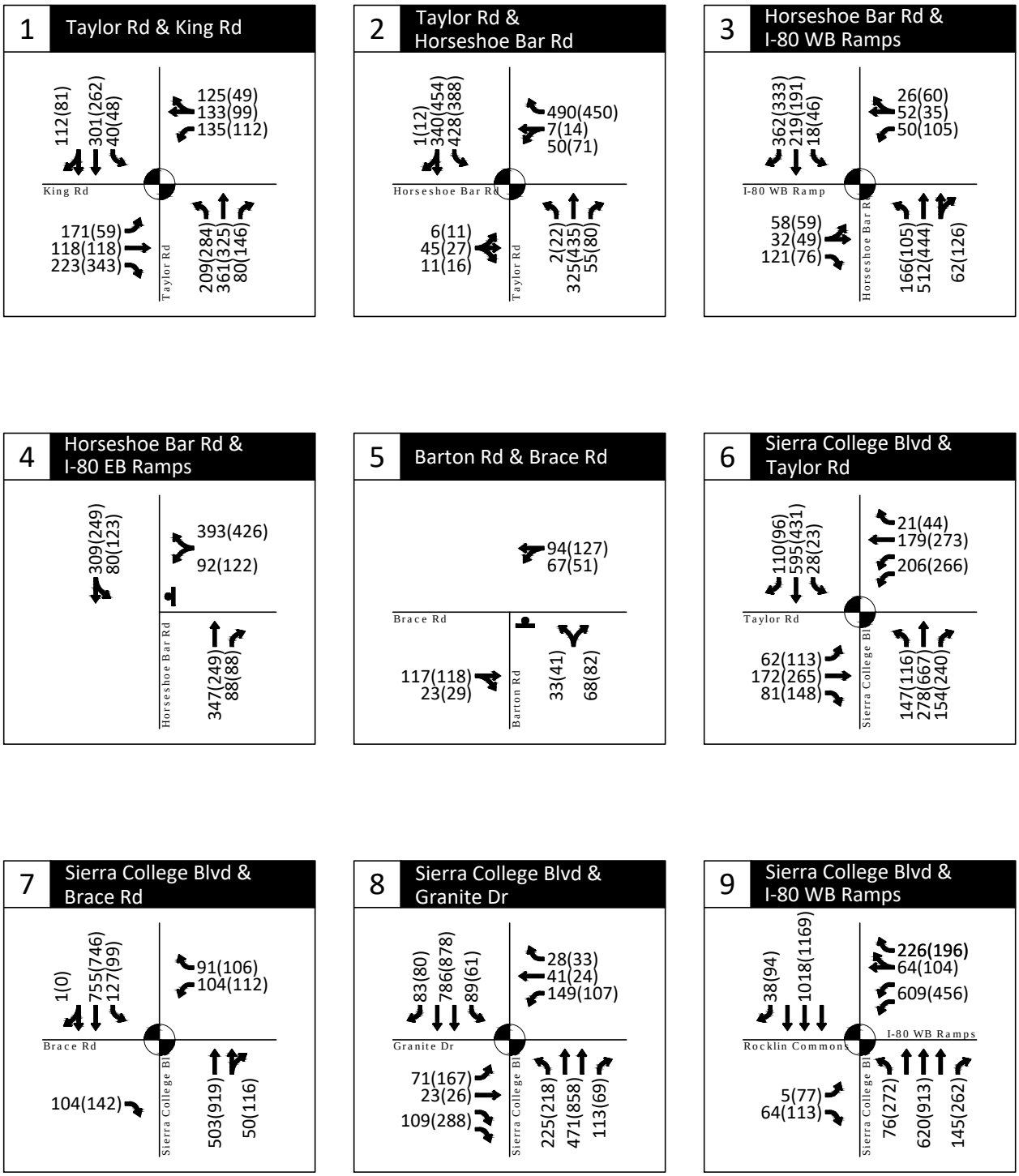
Turning-movement counts were obtained at each of the existing study intersections.

The traffic count dates vary by intersection location. All of the Placer County maintained study intersections were counted in October 2018. The remaining weekday peak hour counts were conducted in November 2016 with two exceptions. Traffic counts at the Granite Drive & Dominguez Road and Rocklin Road & El Don Drive intersections (collected in April 2016) were provided by the City of Rocklin because these locations were added after the Project scoping process was completed. The counts were conducted on a typical weekday during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak time periods. Figure 4 provides a summary of the weekday peak hour turning-movement counts, which represent the hour with the highest volumes in the counting periods. Counts represent Project year 2017 baseline conditions consistent with the date of the notice of preparation (NOP), excluding the County study intersections that were counted in the fall of 2018[5].

In January 2017, manual turning-movement counts were obtained during Saturday for each of the non-County study intersections except for Granite Drive & Dominguez Road and Rocklin Road & El Don Drive (again because these locations were added after the Project scoping process was completed). Counts were conducted on a typical weekend during the midday (11:00 AM to 1:00 PM) peak time period. Counts at Granite Drive & Dominguez Road and Rocklin Road & El Don Drive were conducted in September 2017. Figure 5 provides a summary of the weekend turning-movement peak hour counts, which represent the hour with the highest volumes in the counting periods. Appendix "A" contains the traffic count worksheets used in this study. Counts were balanced between closely spaced intersections and between different data collection dates, as needed.

Existing signal timing at each of the signalized intersections was obtained from the jurisdiction operating the respective intersection and was used for to conduct the analysis for existing conditions.

[5] Use of the 2017 baseline traffic counts in this report is appropriate recognizing 1) review traffic volumes at key locations on the Sierra College Boulevard corridor found comparable volumes between 2017 and 2018, 2) the cumulative short-term analyses were developed accounting for all identified approved in-process developments as of the time of the counts in 2017, and 3) the cumulative long-term conditions analysis was developed based on long-term travel demand model volumes.



AM(PM) - Weekday Traffic Volume

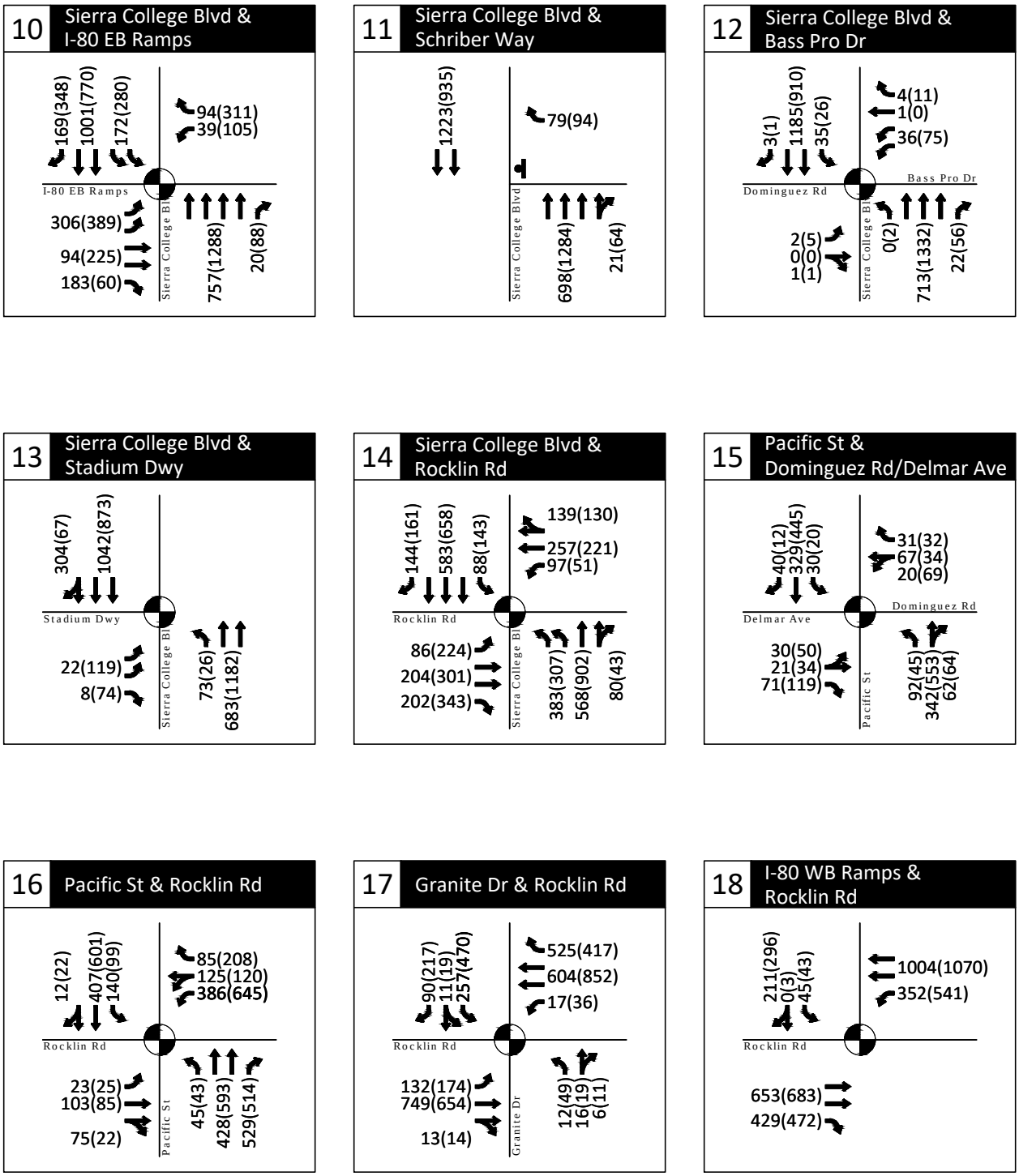
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
4A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:51pm - aloveday Layout Tab: Ex AM_PM A



AM(PM) - Weekday Traffic Volume

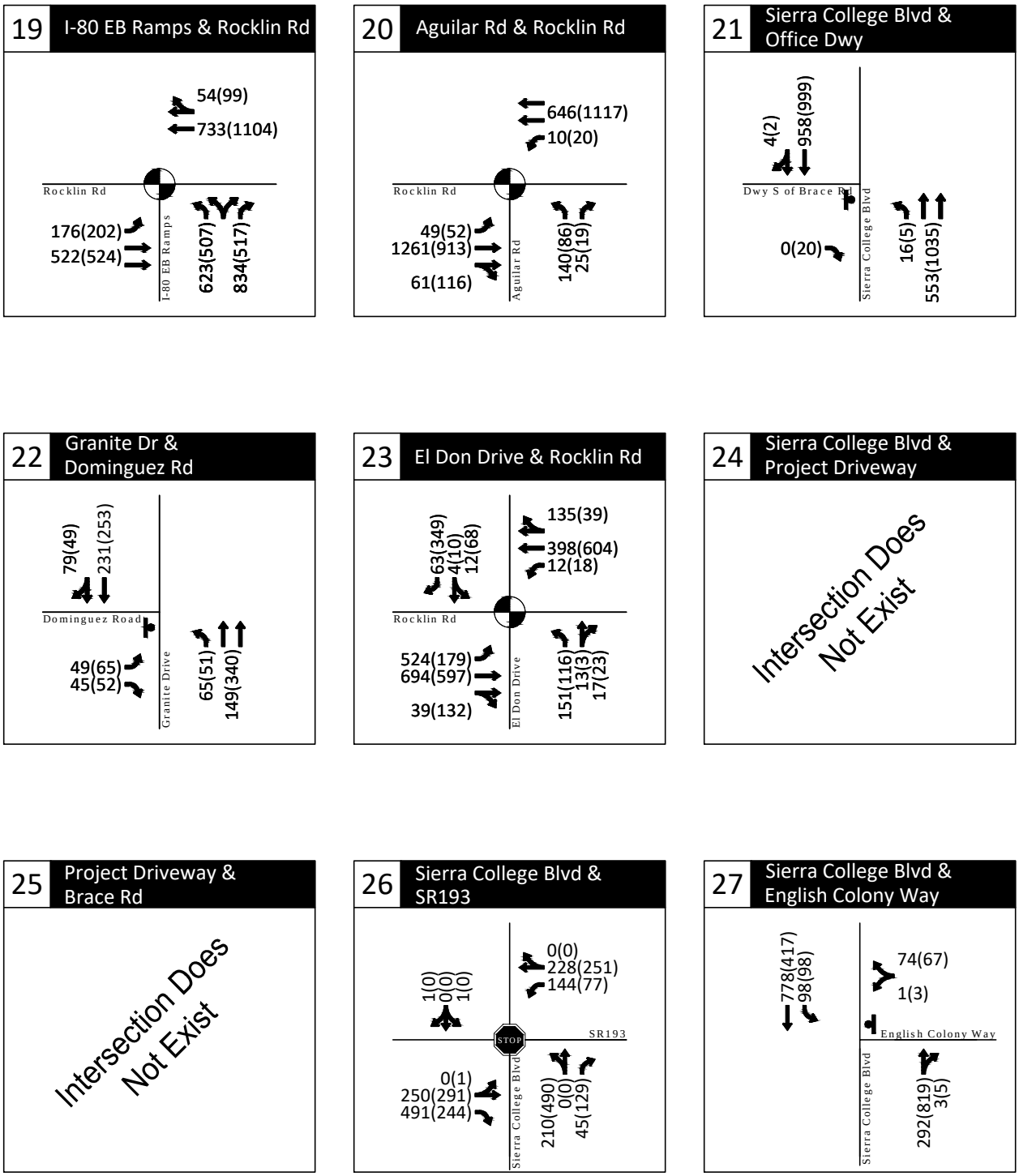
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
4B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:52pm - aloveday Layout Tab: Ex AM_PM B



AM(PM) - Weekday Traffic Volume

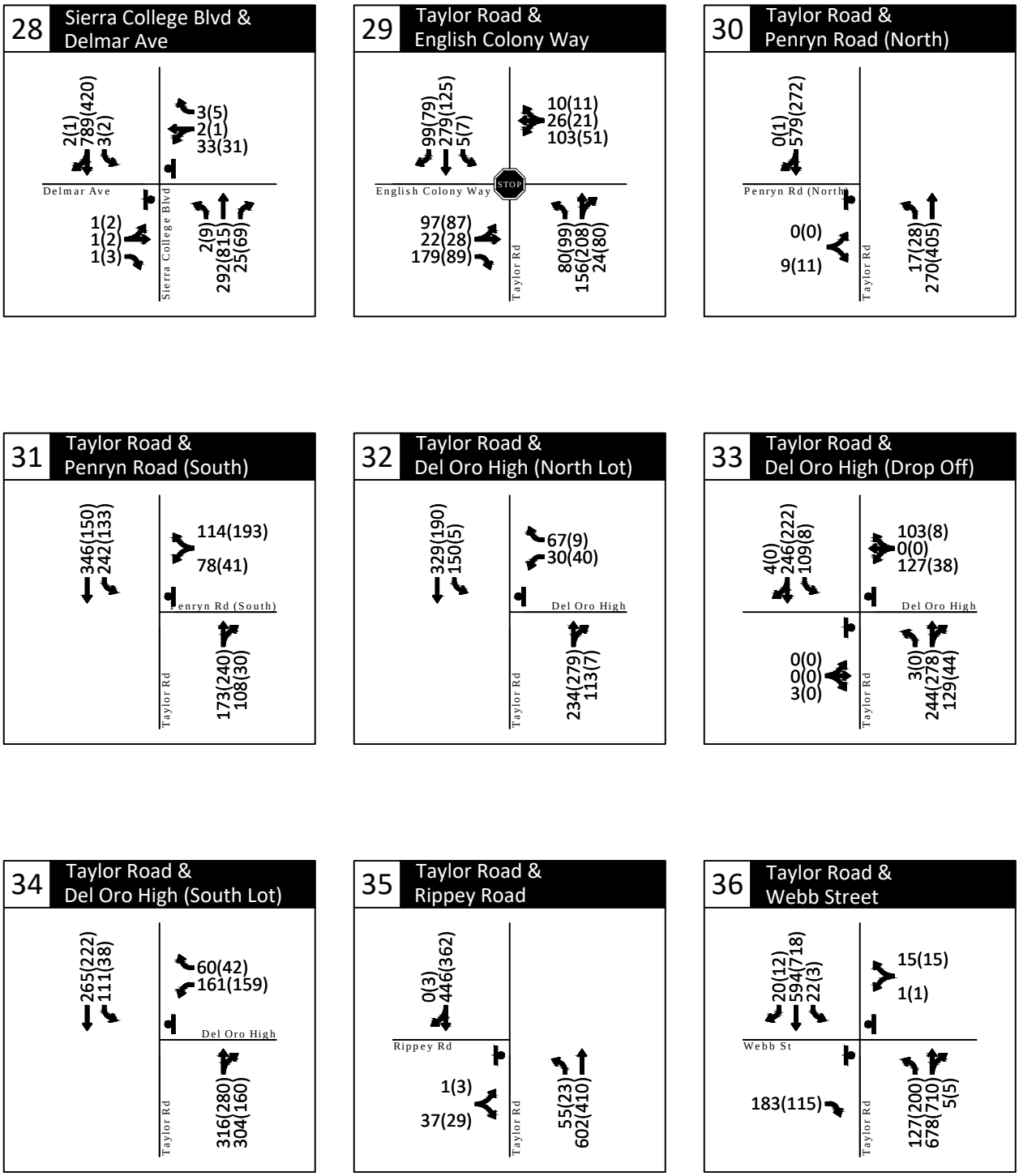
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
4C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:53pm - aloveday Layout Tab: Ex AM_PM C



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
4D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:53pm - aloveday Layout Tab: Ex AM_PM D

37	Project Driveway East & Brace Road

Intersection Does Not Exist

AM(PM) - Weekday Traffic Volume

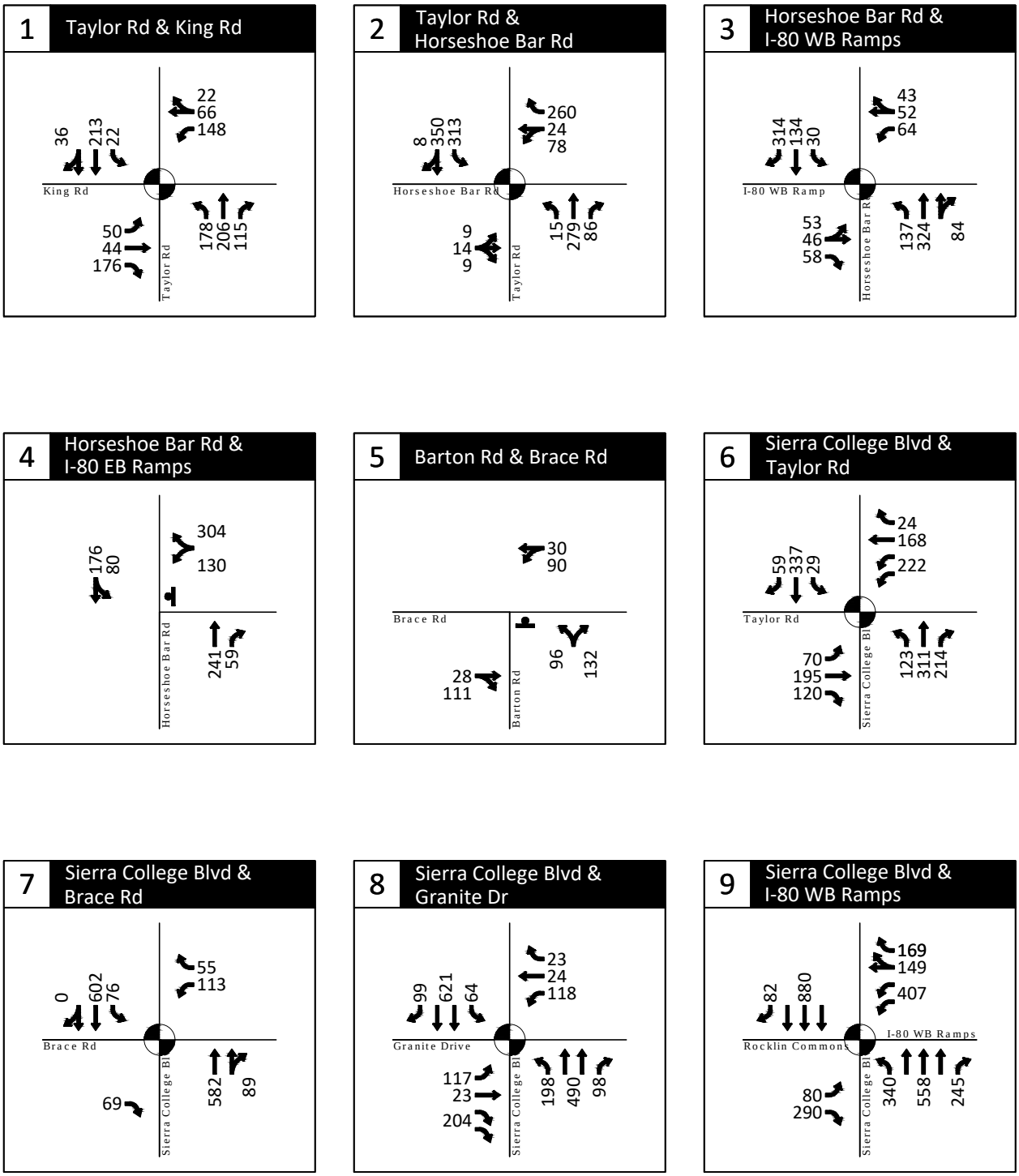
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
4E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:54pm - aloveday Layout Tab: Ex AM_PM E



- Weekend Midday Traffic Volume

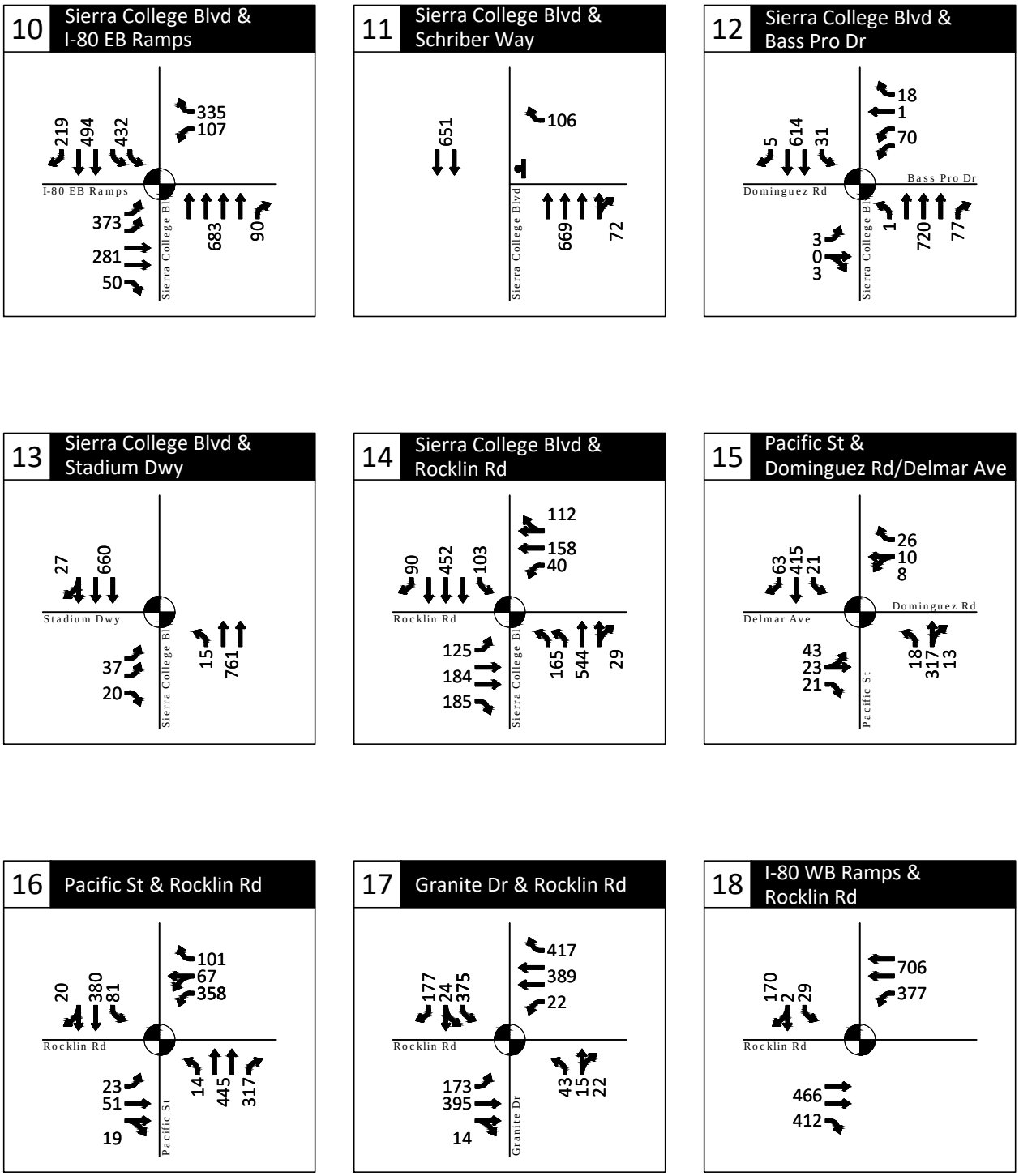
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
5A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:55pm - aloveday Layout Tab: Ex SAT A



- Weekend Midday Traffic Volume

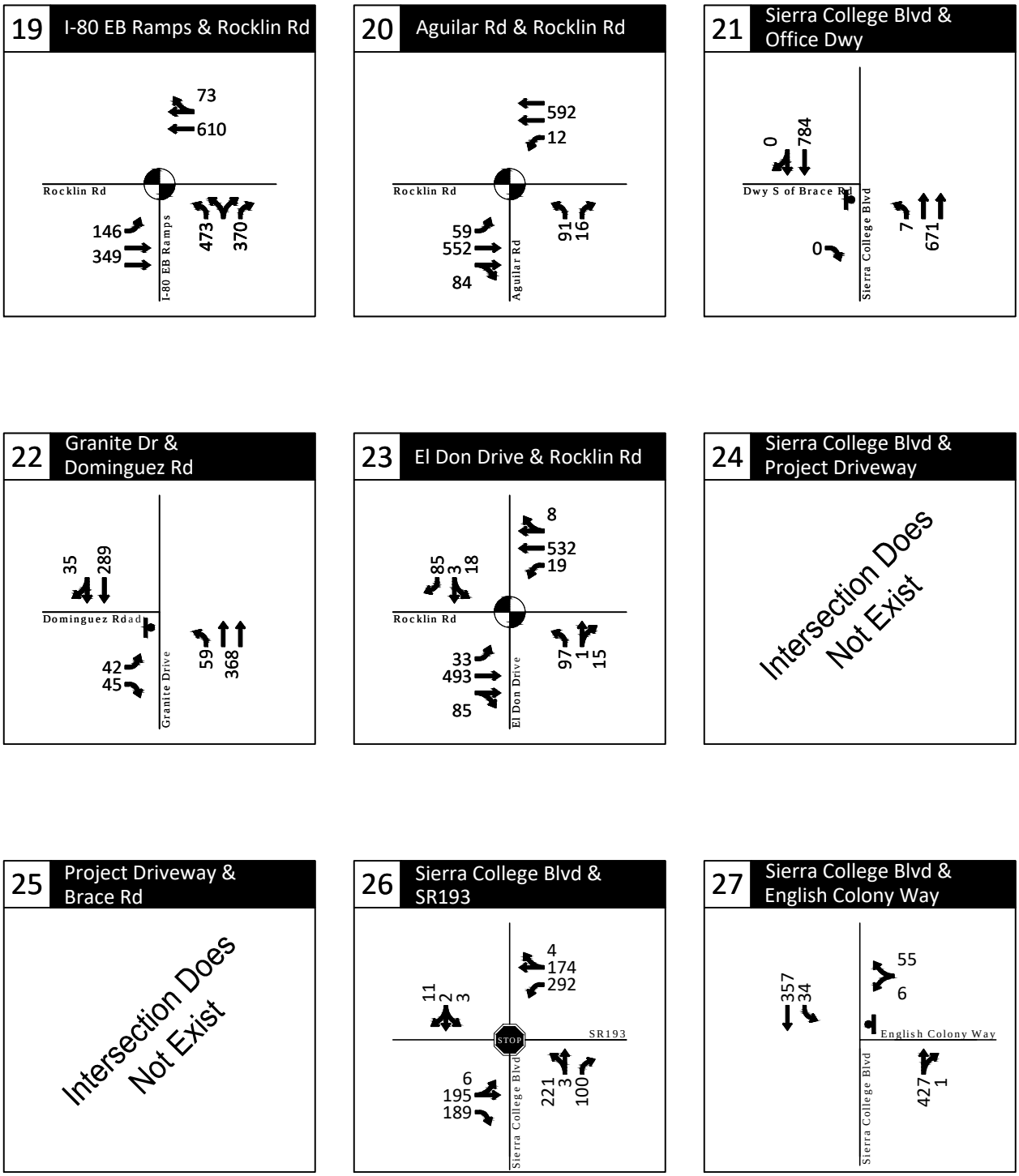
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
5B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:55pm - aloveday Layout Tab: Ex SAT B



- Weekend Midday Traffic Volume

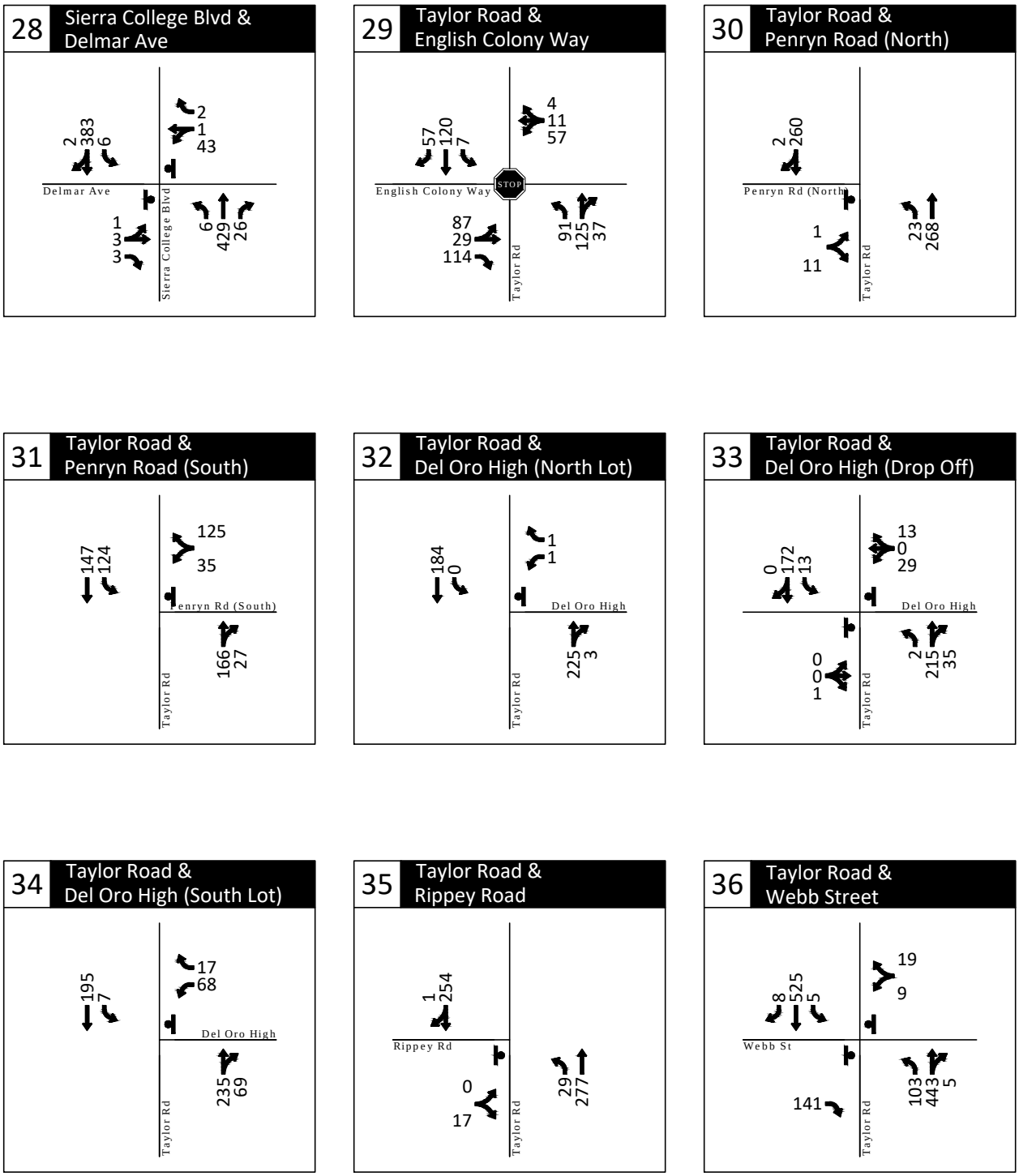
- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
5C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:56pm - aloveday Layout Tab: Ex SAT C



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
5D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 1:56pm - aloveday Layout Tab: Ex SAT D

37	Project Driveway East & Brace Road
Intersection Does Not Exist	

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Existing Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
5E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 2:02pm - aloveday Layout Tab: Ex SAT E

4.3.1 Levels of Service Analysis

LOS analysis was performed for the AM and PM peak hours during weekday, and midday peak hour during weekend, using existing turning movement volumes. Table 6 summarizes the level-of-service analysis for the study intersections under existing traffic conditions. As shown, the following intersections operate at an unsatisfactory LOS:

- Horseshoe Bar Road & I-80 Eastbound Ramp (AM, PM)
- Sierra College Boulevard & Taylor Road (PM)
- Sierra College Boulevard & Rocklin Road (AM and PM)
- Pacific Street & Dominguez Road/Delmar Avenue (PM)
- Pacific Street & Rocklin Road (AM)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- El Don Drive & Rocklin Road (AM and PM)
- Sierra College Boulevard & SR-193 (PM)
- Sierra College Boulevard & Delmar Avenue (AM and PM)
- Taylor Road & Penryn Road (South) (AM)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)
- Taylor Road & Webb Street (PM and MD)

Appendix "B" includes the level-of-service worksheets.

Table 6: Existing Conditions Intersection LOS Analysis, Weekday AM/PM & Weekend Midday Peak Hours

ID	Intersection	Intersection Control Type	Weekday AM		Weekday PM		Weekend MD	
			Delay	LOS	Delay	LOS	Delay	LOS
1	Taylor Rd/King Rd	Signal	33.3	C	37.7	D	21.8	C
2	Taylor Rd/Horseshoe Bar Rd	Signal	30.3	C	26.3	C	13.9	B
3	Horseshoe Bar Rd/I-80 Westbound Ramp	Signal	13.8	B	14.0	B	13.4	B
4	Horseshoe Bar Rd/I-80 Eastbound Ramp	TWSC	**70.2**	**F**	**68.2**	**F**	28.7	D
5	Barton Rd/Brace Rd	TWSC	10.8	B	10.7	B	12.2	B
6	Sierra College Blvd/Taylor Rd	Signal	31.8	C	**38.3**	**D**	25.0	C
7	Sierra College Blvd/Brace Rd	Signal	9.7	A	10.7	B	9.1	A
8	Sierra College Blvd/Granite Dr	Signal	24.4	C	27.1	C	22.6	C

ID	Intersection	Intersection Control Type	Weekday AM		Weekday PM		Weekend MD	
			Delay	LOS	Delay	LOS	Delay	LOS
9	Sierra College Blvd/I-80 WB Ramps	Signal	13.2	B	19.0	B	19.3	B
10	Sierra College Blvd/I-80 EB Ramps	Signal	14.6	B	16.1	B	16.5	B
11	Sierra College Blvd/Schriber Way	TWSC	9.2	A	9.2	A	10.3	B
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	6.5	A	7.5	A	8.7	A
13	Sierra College Blvd/Stadium Dwy	Signal	6.1	A	6.6	A	4.4	A
14	Sierra College Blvd/Rocklin Rd	Signal	**35.7**	**D**	**43.3**	**D**	24.9	C
15	Pacific St/Dominguez Rd-Delmar Ave	Signal	15.4	B	**43.7**	**D**	12.7	B
16	Pacific St/Rocklin Rd	Signal	**39.9**	**D**	33.7	C	19.6	B
17	Granite Dr/Rocklin Rd	Signal	**40.7**	**D**	**50.8**	**D**	**43.7**	**D**
18	I-80 Westbound Ramps/Rocklin Rd	Signal	20.4	C	38.8	D	20.6	C
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	31.0	C	30.3	C	24.6	C
20	Aguilar Rd/Rocklin Rd	Signal	10.4	B	8.1	A	8.0	A
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.3	A	12.6	B	0.1	A
22	Granite Dr/Dominguez Rd	TWSC	11.7	B	12.8	B	12.5	B
23	El Don Dr/Rocklin Rd	Signal	**35.8**	**D**	**34.9**	**D**	13.7	B
26	Sierra College Blvd/SR-193	AWSC	22.5	C	**43.1**	**E**	19.7	C
27	Sierra College Blvd/English Colony Way	TWSC	11.0	B	19.8	C	12.2	B
28	Sierra College Blvd/Delmar Avenue	TWSC	**38.0**	**E**	**41.4**	**E**	22.2	C
29	Taylor Rd/English Colony Way	AWSC	21.4	C	13.2	B	15.4	C
30	Taylor Rd/Penryn Road (North)	TWSC	14.4	B	10.0	B	10.2	B
31	Taylor Rd/Penryn Road (South)	TWSC	**233.5**	**F**	15.5	C	12.0	B
32	Taylor Rd/Del Oro High School North Lot	TWSC	**31.9**	**D**	12.0	B	13.5	B
33	Taylor Rd/Del Oro High School Drop-Off	TWSC	**265.0**	**F**	14.1	B	19.4	C
34	Taylor Rd/Del Oro High School South Lot	TWSC	**40.9**	**E**	15.7	C	16.1	C
35	Taylor Rd/Rippey Road	TWSC	13.9	B	11.3	B	11.6	B
36	Taylor Rd/Webb Street	TWSC	21.4	C	**26.8**	**D**	**70.2**	**F**

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay is reported for the worst movement.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Source: Kittelson & Associates, Inc. 2019

4.3.2 Queuing Analysis

The queueing analysis below follows the significance criteria and queueing methodology defined in Sections 2 and 3. Appendix C provides the summary tables for the weekday AM, PM, and weekend midday peak hours as well as the storage lengths at each intersection.

As shown in the summary tables, the 95th percentile queues would extend beyond the available storage lengths at the following intersections:

- Taylor Road & King Road (AM, PM, and MD)
- Taylor Road & Horseshoe Bar Road (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Westbound Ramp (AM, PM, and MD)
- Sierra College Boulevard & Taylor Road (PM)
- Sierra College Boulevard & Brace Road (PM)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- Sierra College Boulevard & Rocklin Road (AM and PM)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (PM)
- I-80 Eastbound Ramps & Rocklin Road (AM and PM)
- El Don Drive & Rocklin Road (AM and PM)
- Taylor Road & English Colony Way (AM and MD)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (PM)
- The westbound through at I-80 Eastbound Ramps & Rocklin Road would affect operations at Aguilar Road & Rocklin Road (PM)

4.3.3 Simulation Supplemental Evaluation

The evaluation was prepared for informational purposes. The total network performance results of the simulation runs are presented in Table 7 and the arterial performance results are presented in Table 8.

As shown, all vehicles are able to access (zero vehicles denied entry) the network during the AM and midday study peak hours and only one vehicle was denied access during the PM peak hour. Review of the SimTraffic output files also showed that the Synchro queueing analysis captured queueing impacts shown in SimTraffic. SimTraffic does show longer queues for certain movements; however, both Synchro and SimTraffic queues exceed storage capacity, and therefore the impact would be captured per the significance criteria.

For the Sierra College Boulevard corridor, the posted speed limit along the majority of the corridor is 40 miles per hour and the approximate length of the corridor from Taylor Road to Stadium Way is 1.5 miles. Under free flow conditions and without stop delay at controlled intersections, the travel time along the corridor would be about 135 seconds. Total travel time reported includes delay associated with stops at controlled intersections as well as some congestion along the corridor. The average arterial speed also shows that the corridor is operating under posted signed limits; however, this again includes delay associated with controlled intersections.

Table 7: Existing Conditions – Simulation Total Network Performance Results

Peak Hour	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry
AM	46.8	5,333	5,325	0
PM	54.7	7,131	7,125	1
MD	40.0	5,795	5,797	0

Notes:
(s): seconds
Total Delay/Vehicle: Total delay is equal to the travel time minus the travel time for a vehicle with no other vehicles or control devices. This delay is divided by the number of vehicles to obtain the total delay per vehicle.

Vehicles Entered/Exited: Represents the number of vehicles counted entering and exiting the link or area during the interval. This value does not include vehicles moving from one intersection to the next with the arterial or network.

Vehicles Denied Entry: This value represents the number of vehicles unable to enter a link due to congestion and are waiting to enter. These vehicles can either be from an external link or from a mid-block source.

Source: Kittelson & Associates, Inc. 2019

Table 8: Existing Conditions – Simulation Sierra College Boulevard Arterial Performance Results

Segment	Peak Hour	Direction	Total Delay (s)	Total Travel Time (s)	Average Arterial Speed (mph)
Sierra College Boulevard between Taylor Road & Stadium Way	AM	Northbound	70.8	191.0	28
		Southbound	137.9	326.1	25
	PM	Northbound	138.2	257.2	21
		Southbound	123.9	309.8	26
	MD	Northbound	85.8	205.4	26
		Southbound	100.1	286.0	29

Notes:
(s): seconds
Total Delay: Total Delay for the average vehicle traveling the length of the corridor including stopped delay and congestion delay.
Total Travel Time: Time in seconds for the average vehicle to travel the length of the corridor.
Average Arterial Speed: Average speed of the average vehicle traveling the length of the corridor.
Source: Kittelson & Associates, Inc. 2019

The detailed network and arterial performance output sheets are presented in Appendix "D".

4.4 PLACER COUNTY ROADWAY OPERATIONS

Following consultation with Placer County staff, five County roadway segments were analyzed. Analysis for the study segments was conducted using the LOS criteria defined as noted in Section 3.1. Table 9 outlines the existing roadway volume and associated level of service for the study segments. As shown, all study segments currently satisfy the County's LOS C standard.

Table 9: Existing Conditions – Placer County Weekday ADT Roadway Segment LOS Analysis

Roadway	Segment	Number of Lanes	ADT	LOS
Sierra College Boulevard	SR-193 to English Colony Way	2	8,290	A
	English Colony Way to Delmar Ave	2	11,120	B
	Delmar Ave to Loomis Town Limits	2	11,120	B
SR-193	Lincoln City Limits to Sierra College Boulevard	2	10,360	A
	Sierra College Boulevard to Clark Tunnel Road	2	7,200	A

Notes:
ADT volumes sourced from Bickford Ranch Specific Plan EIR Addendum (October 2015) and adjusted based on City of Rocklin Travel Demand Model Growth Rates.
Source: Kittelson & Associates, Inc. 2019

4.5 FREEWAY FACILITIES OPERATIONS

Following consultation with Caltrans District 3 staff, freeway mainline analysis was prepared for the I-80 mainline segments east and west of the Sierra College Boulevard interchange. The Caltrans Performance Measurement System (PeMS) was queried for mainline traffic during the intersection data collection period; however, limited data was available due to Caltrans equipment issues (poor detector health). Additional time periods were queried for the year outside of the weeks of intersection data collection all of which showed poor detector health until Fall 2017. The Caltrans freeway data quality improved in September 2017; therefore, for the following analysis, data was collected between September 19th and October 21st of 2017 for each Tuesday, Wednesday, Thursday for weekday conditions and for each Saturday for weekend conditions. Peak hour factors were calculated from ramp volume data sourced from intersection counts.

4.5.1 Freeway Mainline Basic Segment Analysis

Analysis for the study segments was conducted using the Highway Capacity Software 2010 (HCS 2010). Table 10 outlines the existing mainline volume, density and associated level of service for the study segments. As shown, all study segment operations satisfy the applicable Caltrans LOS D standard.

Appendix "E" includes the freeway mainline level-of-service worksheets.

Table 10: Existing Conditions – I-80 Mainline LOS Analysis, Weekday AM/PM Peak Hour

ID	Segment	Direction	Number of Lanes	Weekday AM			Weekday PM			Weekend MD		
				Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS
1	I-80 east of Sierra College Boulevard	Eastbound	3	3,110	19.0	C	4,398	25.8	C	3,980	22.5	C
		Westbound	3	4,062	25.4	C	3,803	22.5	C	3,892	21.5	C
2	I-80 west of Sierra College Boulevard	Eastbound	3	3,118	19.1	C	4,042	23.4	C	3,963	22.4	C
		Westbound	3	3,702	22.9	C	3,716	22.0	C	3,812	21.1	C

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

4.5.2 Ramp Metering Supplemental Evaluation

Ramp metering analysis was requested by Caltrans to determine whether queues from the future ramp meter at the I-80 Westbound slip ramp from southbound Sierra College Boulevard would exceed storage and affect operations along the arterial. While documented later in this report for future conditions, no ramp metering assessment was prepared for existing conditions because the ramp meter had not been activated at the time of data collection.

Section 5
Project Characteristics

5.0 PROJECT CHARACTERISTICS

5.1 PROJECT DESCRIPTION

The Project proposes an approximately 155,000 square foot Costco Warehouse with a tire center and a Costco Gasoline fuel station. The Costco Gasoline fuel station is expected to open with 24 fueling positions and is designed to expand to 30 fueling positions. To capture all the potential impacts, the traffic analysis presented in this report assumes all 30 fueling positions are in service. The approximately 17.4-acre site would provide 778 parking stalls including 16 accessible parking stalls. The proposed site plan exceeds the Town's minimum parking requirement of five stalls per thousand square feet (775 spaces). Opening is anticipated in 2020.

5.1.1 Site Driveway Access

Figure 6 illustrates the proposed development plan. Three Project Driveway Options are proposed as follows:

Project Driveway Option 1A:

- An unsignalized right-in/right-out only on Brace Road located approximately 215 feet east of Sierra College Boulevard (measured from Sierra College Boulevard curb to west curb of access)
  - The driveway will be open to the public and serve entering warehouse delivery trucks.
  - A raised median will be installed on Brace Road to limit the proposed west Costco driveway to right-turns only. The median will be installed between Sierra College Boulevard and the existing Homewood Lumber access on the north side of Brace Road. The median will maintain the existing eastbound left turn pocket on Brace Road that provides access to Homewood Lumber (no change to Homewood Lumber access) and will also maintain the existing queue storage for the westbound left turn at Sierra College Boulevard.
- A new signalized intersection along Sierra College Boulevard located approximately 750 feet south of Brace Road and 625 feet north of Granite Drive (measured centerline to centerline)
  - The proposed new intersection will include a northbound right-turn lane with right-turn signal overlap, one eastbound (entry) lane to the Costco site and three westbound (exit) lanes (interim dual left-turns and a separate right-turn).
  - The new intersection will be designed to accommodate a potential fourth approach (west leg) to serve potential future development on the vacant lot to the west.
- An unsignalized full access on Brace Road located approximately 675 feet east of Sierra College Boulevard (measured from Sierra College Boulevard curb to west curb of access). This new access would be shared with an existing apartment building located to the west. Starlight Lane would be closed and vacated.

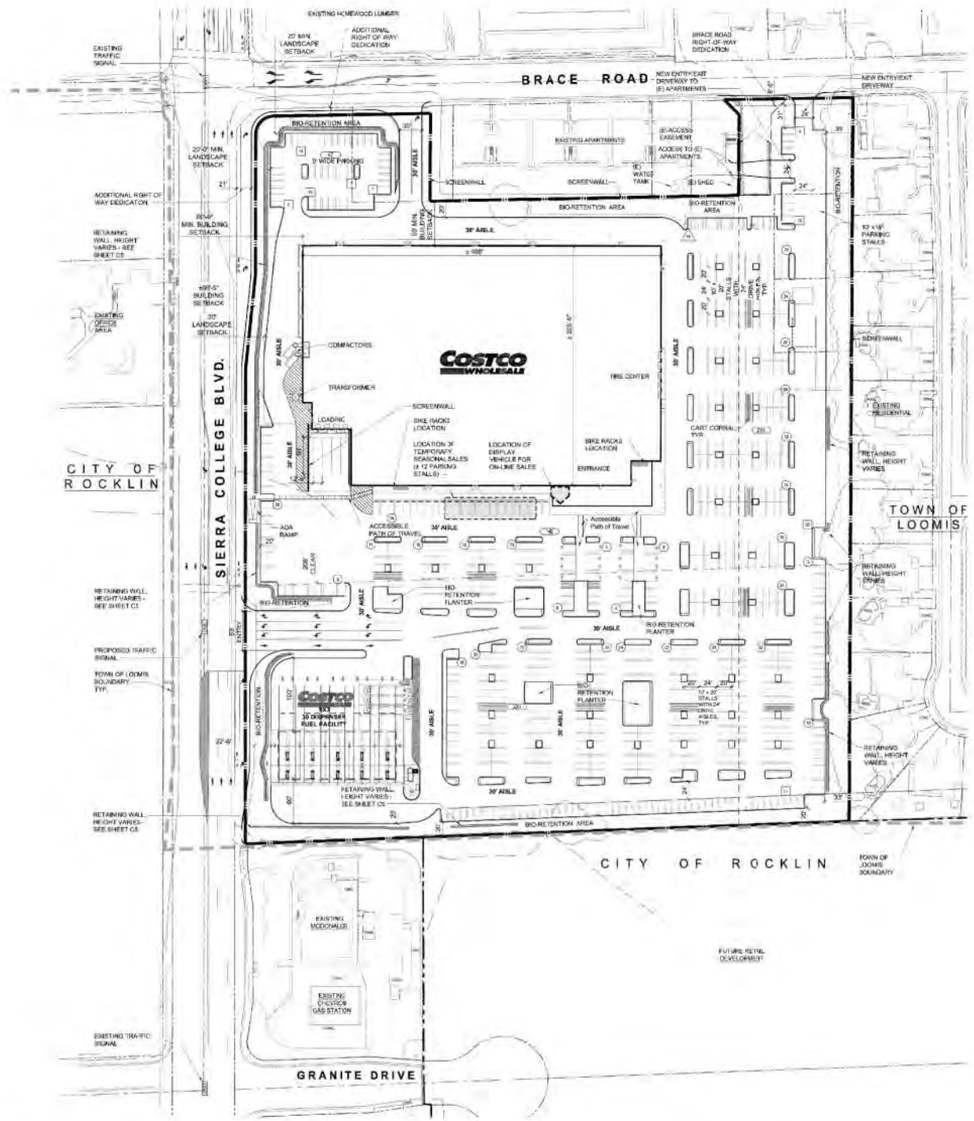
Project Driveway Option 1B:

- An unsignalized right-in/right-out only on Brace Road located approximately 215 feet east of Sierra College Boulevard (measured from Sierra College Boulevard curb to west curb of access)
  - The driveway will be open to the public and serve entering warehouse delivery trucks.
  - A raised median will be installed on Brace Road between Sierra College Boulevard and the existing driveway to the east to limit Costco access to right-turns only to maintain access to land use on the north side of the street and not impact the queue storage for the westbound left turn at Sierra College Boulevard.
- A new signalized intersection along Sierra College Boulevard located approximately 750 feet south of Brace Road and 625 feet north of Granite Drive (measured centerline to centerline)
  - The proposed new intersection will include a northbound right-turn lane with right-turn signal overlap, one eastbound (entry) lane to the Costco site and three westbound (exit) lanes (interim dual left-turns and a separate right-turn).
  - The new intersection will be designed to accommodate a potential fourth approach (west leg) to serve potential future development on the vacant lot to the west.
- A roadway connection between the south side of the Costco site and Granite Drive
  - The north-south drive aisle connection to Granite Drive will be located approximately 165 feet east of the existing private driveway access on the north side of Granite Drive serving McDonald's and Chevron (distance measured from east curb existing driveway to west curb of proposed of north-south drive aisle).
  - Granite Drive will be modified between Sierra College Boulevard and the new north-south Costco connection to provide side-by-side eastbound and westbound left-turn lanes separated by a new raised median on Granite Drive.

Project Driveway Option 1C:

- An unsignalized right-in/right-out only on Brace Road located approximately 215 feet east of Sierra College Boulevard (measured from Sierra College Boulevard curb to west curb of access)
  - The driveway will be open to the public and serve entering warehouse delivery trucks.
  - A raised median will be installed on Brace Road between Sierra College Boulevard and the existing driveway to the east to limit Costco access to right-turns only to maintain access to land use on the north side of the street and not impact the queue storage for the westbound left turn at Sierra College Boulevard.
- An unsignalized full access on Brace Road located approximately 675 feet east of Sierra College Boulevard (measured from Sierra College Boulevard curb to west curb of access). This new access would be shared with an existing apartment building located to the west. Starlight Lane would be closed and vacated.

- A new signalized intersection along Sierra College Boulevard located approximately 750 feet south of Brace Road and 625 feet north of Granite Drive (measured centerline to centerline)
  - The proposed new intersection will include a northbound right-turn lane with right-turn signal overlap, one eastbound (entry) lane to the Costco site and three westbound (exit) lanes (interim dual left-turns and a separate right-turn).
  - The new intersection will be designed to accommodate a potential fourth approach (west leg) to serve potential future development on the vacant lot to the west.
- A roadway connection between the south side of the Costco site and Granite Drive
  - The north-south drive aisle connection to Granite Drive will be located approximately 165 feet east of the existing private driveway access on the north side of Granite Drive serving McDonald's and Chevron (distance measured from east curb existing driveway to west curb of proposed of north-south drive aisle).
  - Granite Drive will be modified between Sierra College Boulevard and the new north-south Costco connection to provide side-by-side eastbound and westbound left-turn lanes separated by a new raised median on Granite Drive.



Project Data

Client:	Costco Wholesale 599 Lake Drive Issaquah, WA 98027
Project Address:	Sierra College Boulevard Loomis, CA Town of Loomis

Site Data

Costco Site Area:	17.31 AC (754,042 s.f.)
Right of Way Dedication	0.50 AC (22,148 s.f.)
Jurisdiction:	Town of Loomis, CA
Existing Zoning:	GC - General Commercial / RM 5 - Medium Density Residential
Boundary Information:	This plan has been prepared using the Topographic Survey dated October 2016 prepared by Kier & Wright Civil Engineers & Surveyors, Inc.

Building Data

Total:	± 153, 000 s.f.

Parking Data

9' wide stalls:	176 stalls
10' wide stalls:	589 stalls
Accessible stalls:	16 stalls
Total Parking:	781 stalls (5.1 / 1,000)
5' wide Motorcycle stalls:	16 stalls
Parking Required: (Town of Loomis)	765 5.0 / 1,000

Vicinity Map
Scale: N.T.S.

COSTCO WHOLESALE
DBA # P256

DB+A

COSTCO LOOMIS, CA
CONCEPT SITE PLAN - OPTION 1A

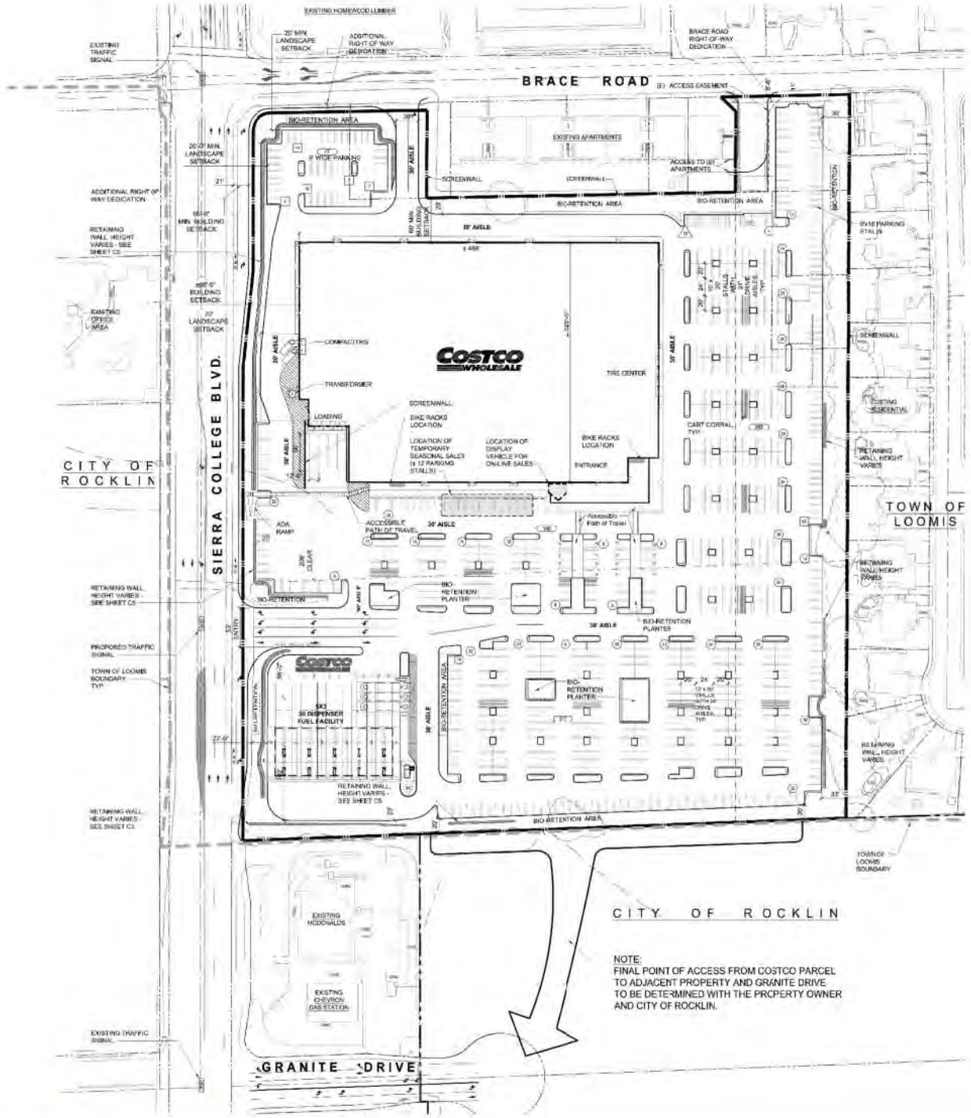
SCALE: 1"=60' 0"
OCTOBER 14, 2019

SHEET 1 of 1

Project Site Plan
Project Driveway Option 1A
Loomis, California

Figure 6A

KITTELSON & ASSOCIATES



Project Data

Client:	Costco Wholesale 999 Lake Drive Issaquah, WA 98027
Project Address:	Sierra College Boulevard Loomis, CA Town of Loomis

Site Data

Costco Site Area:	17.31 AC (754,042 s.f.)
Right of Way Dedication	0.50 AC (22,148 s.f.)
Jurisdiction:	Town of Loomis, CA
Existing Zoning:	GC - General Commercial / RM 5 - Medium Density Residential
Boundary Information:	This plan has been prepared using the Topographic Survey dated October 2016 prepared by Kier & Wright Civil Engineers & Surveyors, Inc.

Building Data

Total:	153, 000 s.f.

Parking Data

9' wide stalls:	110 stalls
10' wide stalls:	658 stalls
Accessible stalls:	16 stalls
Total Parking:	784 stalls (5.1 / 1,000)
5' wide Motorcycle stalls:	16 stalls

Parking Required: (Town of Loomis)	765 5.0 / 1,000

Vicinity Map
Scale: N.T.S.

DBA # P256

DB+A

COSTCO LOOMIS, CA

CONCEPT SITE PLAN - OPTION 1B

SCALE: 1"=60'-0"
OCTOBER 14, 2019

SHEET 1 of 1

Project Site Plan
Project Driveway Option 1B
Loomis, California

Figure 6B

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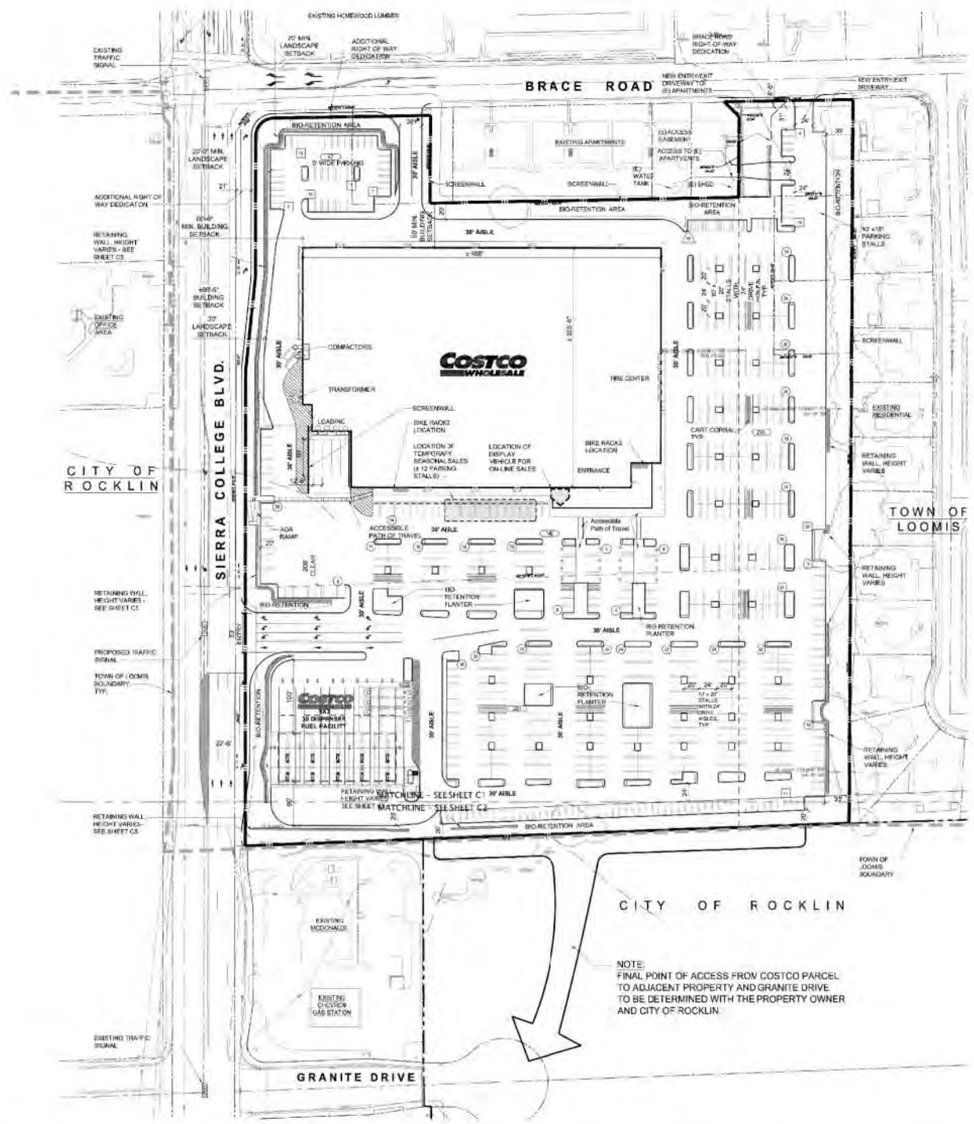


Project Data

Client:	Costco Wholesale 999 Lake Drive Issaquah, WA 98027
Project Address:	Sierra College Boulevard Loomis, CA Town of Loomis

Site Data

Costco Site Area:	17.31 AC (754,042 s.f.)
Right of Way Dedication	0.50 AC (22,148 s.f.)
Jurisdiction:	Town of Loomis, CA
Existing Zoning:	GC - General Commercial / RM 5 - Medium Density Residential
Boundary Information:	This plan has been prepared using the Topographic Survey dated October 2016 prepared by Kier & Wright Civil Engineers & Surveyors, Inc.

Building Data

Total:	± 153, 000 s.f.

Parking Data

9' wide stalls:	176 stalls
10' wide stalls:	589 stalls
Accessible stalls:	16 stalls
Total Parking:	781 stalls (5.1 / 1,000)
5' wide Motorcycle stalls:	16 stalls
Parking Required: (Town of Loomis)	765 5.0 / 1,000

Vicinity Map
Scale: N.T.S.

COSTCO WHOLESALE
DBA # P256

DB+A

COSTCO LOOMIS, CA
CONCEPT SITE PLAN - OPTION 1C

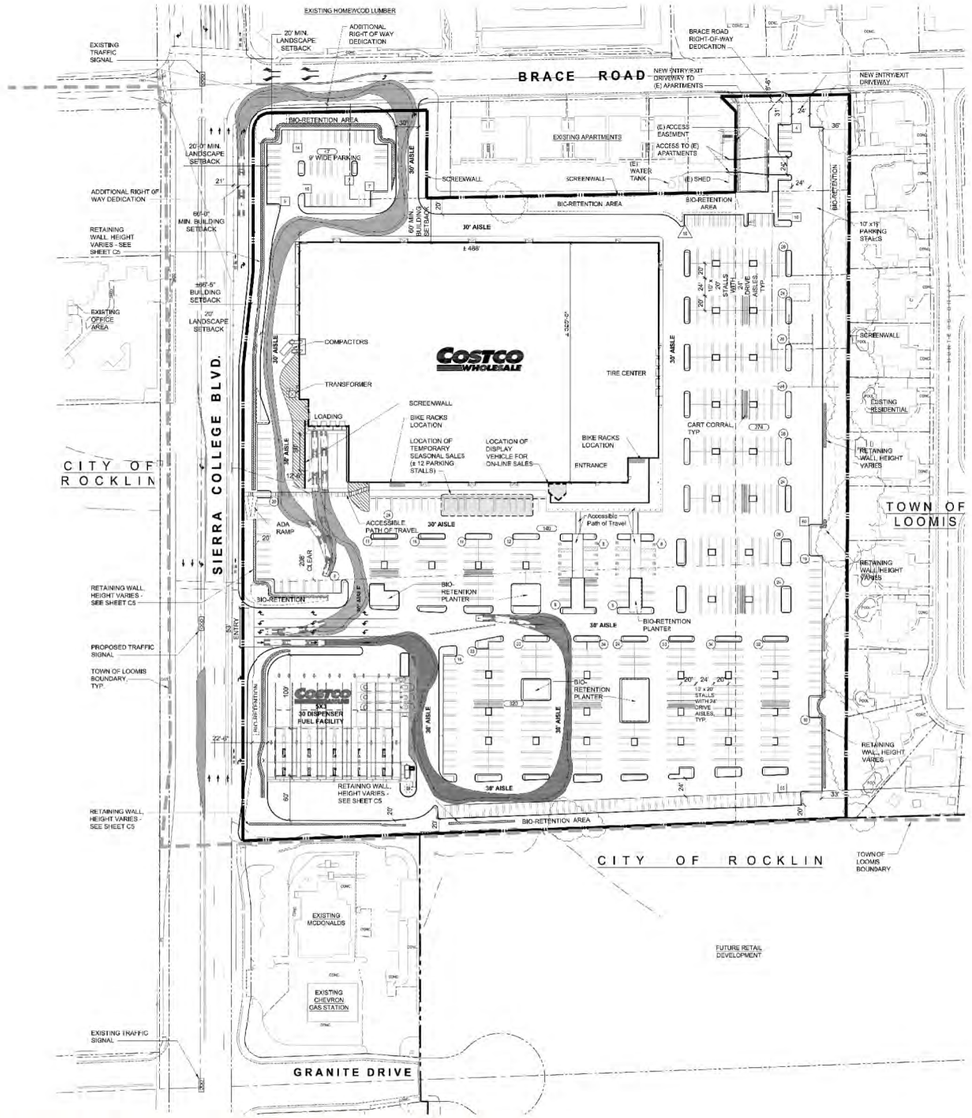
SCALE: 1"=60' 0"
OCTOBER 14, 2019

SHEET 1 of 1

Project Site Plan
Project Driveway Option 1C
Loomis, California

Figure 6C

KITTELSON & ASSOCIATES



Project Data

Client:	Costco Wholesale 999 Lake Drive Issaquah, WA 98027
Project Address:	Sierra College Boulevard Loomis, CA Town of Loomis

Site Data

Costco Site Area:	17.31 AC (754,042 s.f.)
Right of Way Dedication	0.50 AC (22,148 s.f.)
Jurisdiction:	Town of Loomis, CA
Existing Zoning:	GC - General Commercial / RM 5 - Medium Density Residential
Boundary Information:	This plan has been prepared using the Topographic Survey dated October 2016 prepared by Kier & Wright Civil Engineers & Surveyors, Inc.

Building Data

Total:	± 153, 000 s.f.

Parking Data

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Accessible stalls:	16 stalls
Total Parking:	781 stalls (5.1 / 1,000)
5' wide Motorcycle stalls:	16 stalls
Parking Required: (Town of Loomis)	765 5.0 / 1,000

Truck Legend

- Fuel Delivery Truck Route
- Warehouse Delivery Truck Route

Vicinity Map
Scale: N.T.S.

COSTCO WHOLESALE

DBA # P256

DB+A

DAVID BABCOCK + ASSOCIATES
ARCHITECTURE PLANNING LANDSCAPE
2081 MT. DIABLO BLVD., SUITE 120
LAFAYETTE, CALIFORNIA 94549
T: 925.283.5570

COSTCO LOOMIS, CA

TRUCK ROUTE EXHIBIT

SCALE: 1"=60'-0"
OCTOBER 22, 2019

SHEET 1 of 1

Project Site Plan
Truck Route Exhibit
Loomis, California

Figure 6D

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KITTELSON & ASSOCIATES

5.1.2 Proposed Roadway Infrastructure Improvements

Costco will provide the following transportation infrastructure in conjunction with site development.

- Sierra College Boulevard Changes
  - Restripe the existing northbound right-turn lane on Sierra College Boulevard approaching Granite Drive from an exclusive right-turn lane to a shared through/right-turn lane (for Project Driveway Options 1B and 1C only).
  - Dedicate right-of-way and widen Sierra College Boulevard along the Project site frontage and restripe the roadway to provide three northbound through travel lanes and a northbound Class II bicycle lane between Granite Drive and Brace Road.
  - Signalize the proposed new Costco site access intersection on Sierra College Boulevard.
  - Provide traffic signal interconnect between the proposed new Costco site access signalized intersection and the adjacent intersections along Sierra College Boulevard at Brace Road and Granite Drive.
  - Construct a separate northbound right-turn lane on Sierra College Boulevard approaching the proposed new signalized site access intersection. Provide a right-turn overlap signal phase at the intersection.
  - Construct a southbound left-turn lane on Sierra College Boulevard approaching the proposed new signalized Costco site access intersection.
  - Construct a separate northbound right-turn lane on Sierra College Boulevard approaching the signalized Brace Road intersection (the turn lane is proposed to include a 90-foot long taper and 200 feet of right-turn storage). Provide a right-turn overlap signal phase at the intersection.
- Brace Road
  - Dedicate right-of-way and construct standard half-street improvements along the Brace Road site frontage.
  - Install a raised median on Brace Road between Sierra College Boulevard and the existing Homewood Lumber driveway to the east to limit Costco access to right-turns only.
- Granite Drive (for Project Driveway Options 1B and 1C only)
  - Reconstruct Granite Drive east of Sierra College Boulevard to provide side-by-side eastbound and westbound left-turn lanes separated by a new raised median between Sierra College Boulevard and the new north-south drive aisle to the Costco Project site (including widening east of the existing private driveways on Granite Drive to accommodate the side-by-side left-turn lane).

5.2 PROJECT TRIP GENERATION

This section provides an overview of trip generation rates and trip characteristics of Costco Warehouses with Costco Gasoline fuel stations as well as the proposed Project trip generation.

5.2.1 Costco Wholesale Trip Characteristics

Costco Warehouse facilities are open to members only and operate seven days a week. Typically, the warehouse building is open to members on weekdays between the hours of 10:00 AM and 8:30 PM. Weekend operating hours open to members are typically from 9:30 or 10:00 AM to 6:00 PM. The warehouses are typically closed on major holidays. Costco Gasoline fuel stations co-located on the site are typically open seven days a week between 5:00 AM and 10:00 PM.

Trip data has been collected at Costco Warehouses across the United States and documented that they typically generate higher traffic volumes than other commercial land uses with similar building sizes. In addition to the number of trips, the Costco trip generation database also documents trip type based on member survey information that provides the percentage of primary, pass-by, and diverted trips, as further described below.

- Primary Trips (an entirely new trip on the roadway system for the express purpose of driving to and from Costco),
- Pass-by Trips (existing trips that are on roadways adjacent to the site which allow the motorist to turn into the Costco development, and then continue on to their ultimate destination when their shopping is concluded), and
- Diverted Trips (existing trips on nearby roadways in which the motorist makes a decision to drive out-of-direction for a distance to stop at Costco, and when their shopping is concluded, continue on their trip to the ultimate destination).

The Costco Warehouse trip database was used to estimate trips associated with the proposed Project.

5.2.2 Trip Characteristics Application

This report assesses the impacts of pass-by and diverted trip impacts at the study intersections. Typically, pass-by trips have an impact only at the site-access driveways, whereas the impact of diverted trips could extend through additional study area intersections beyond the site access points (diverted trips are typically modeled similar to net new trips at many or all of the study area intersections).

Diverted and pass-by trips were considered together with engineering judgment to identify how these two trip characteristics should be applied to the Project. Recognizing the context of the Project site relative to key transportation corridors, this study assumes that all diverted trips would travel to and from I-80 to access Costco. The diverted trips were treated as new trips to each of the study intersections they were routed through, including the I-80 ramp terminals. Assigning all diverted trips as new trips along the Sierra College Boulevard corridor between the I-80 ramps and the Project site results in a more conservative analysis by assuming worst-case impacts through the interchange ramps and the Sierra College Boulevard corridor.

5.2.3 Trip Generation Estimate

Trip generation studies were conducted at Costco Wholesale sites located across the western region of the United States using industry standard engineering practices consistent with guidance within the Institute of Transportation Engineers (ITE) standard reference, Trip Generation Handbook, 9th Edition Volume 1[6]. These cordon studies were conducted between 2001 and 2010, and include 22 surveys of Costco Warehouses with Costco Gasoline fuel stations in California, Oregon, Washington, Montana, Utah, and Colorado[7].

The Costco Wholesale buildings surveyed range in size between 120,000 square feet and 162,115 square feet, with an average size of 143,782 square feet and had Costco Gasoline fuel stations. As a result, the Costco Wholesale trip generation rates inherently account for Costco Gasoline fuel station trips within the overall rate. Table 11 summarizes the average trip rates recorded.

Table 11: Average Trip Characteristics for a Costco Warehouse with Fuel Station

Land Use	Weekday Daily Trip Rate (per KSF)	Weekday PM Peak Hour of Adjacent Street Traffic Trip Rate (per KSF)			Weekend Midday Peak Hour (per KSF)		
		Total	In	Out	Total	In	Out
Costco Warehouse With Fuel Station	79.27	7.17	48.5%	51.5%	9.79	51%	49%
Primary Trips	No Data		35.1%			50%	
Pass-by Trips	No Data		33.3%			29%	
Diverted Trips	No Data		31.5%			21%	

KSF: Thousand square feet
Source: Kittelson & Associates, Inc. 2019

[6] Note that the Trip Generation Manual (9th Edition and 10th Edition) includes trip data for a "Discount Club" (Land Use Code 857) that is described as follows: "A discount club is a discount store or warehouse where shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items such as food, clothing, tires and appliances; many items are sold in large quantities or bulk. Some sites may include on-site fueling pumps." By comparison, the trip rates presented in Trip Generation for the Discount Club are 41.80 trips/KSF per day weekdays, 4.18 trips/KSF for the weekday PM peak hour, and 6.37 trips/KSF for the Saturday peak hour of the generator; each lower than the Costco trip rates shown in Table 12. Per the Trip Generation Handbook, 3rd Edition, the weekday PM peak hour pass-by rate for Land Use Code 857 is 37% and the Saturday midday peak hour pass-by rate is 30% (both slightly higher than the values shown in Table 12 for Costco) while no diverted trip data was reported (not collected).

[7] Additional documentation of the Costco Trip database is provided in Appendix "F".

Note that no weekday AM peak hour trip rate is shown in Table 11 because the Warehouse building is not open to members during the morning commute hours. Weekday AM peak hour trip generation for the Project site is impacted by the Costco Gasoline fuel station, which is discussed in the next section.

Table 12 presents trip generation estimates for the proposed Loomis Costco Warehouse with Costco Gasoline fuel station facility based on the data shown in Table 11 (daily trips were rounded to the nearest 10). No adjustments for employee transportation demand management (TDM) measures were made as employee trips occur primarily outside of the analysis peak hours.

Table 12: Proposed Loomis Costco Trip Generation Estimate

Land Use	Size	Weekday Daily Trips	Weekday PM Peak Hour of Adjacent Street Traffic			Weekend Midday Peak Hour		
			Total	In	Out	Total	In	Out
Costco Warehouse With Fuel Station	155,000 square feet	12,290	1,111	539	572	1,518	773	745
Pass-by Trips (33.3% PM/28.9% MD)		*(4,090)*	*(370)*	*(179)*	*(191)*	*(439)*	*(223)*	*(216)*
Diverted Trips (31.5% PM/20.6% MD)		*(3,870)*	*(350)*	*(170)*	*(180)*	*(313)*	*(159)*	*(154)*
Net New Trips		**4,330**	**391**	**190**	**201**	**766**	**391**	**375**

Note that the number of weekday and weekend daily (primary, pass-by, and diverted) trips were estimated using weekday PM peak hour trip type percentages.

Source: Kittelson & Associates, Inc. 2019

5.2.4 Weekday AM Peak Hour Trips Associated with Costco Gasoline Fuel Station

Tables 11 and 12 do not show site trips generated during the commuter weekday AM peak hour because the Costco Warehouse will not be open; however, the Costco Gasoline fuel station will be. Weekday AM peak hour trips associated with gasoline operations were estimated based on trip generation data collected at existing Costco Gasoline facilities.

Table 13 below presents the trip characteristics for the fuel station for the weekday AM Peak hour assuming the planned future 30 fueling position capacity. The averages summarized in Table 13 reflect data collected at multiple California locations based on comparable size and available data including Lancaster, Cypress, Commerce, Roseville, and Sunnyvale. Note that only members can access the fuel stations, which require a membership card for pump activation.

Table 13: Costco Gasoline Fuel Station Trip Characteristics

Trip Characteristics	Weekday AM Peak Hour	Weekday AM Peak Hour Trips (30 fueling positions)		
		Total	In (50%)	Out (50%)
Total Trip Rate	13.98 trips/fuel position	420	210	210
Internal Trip Percentage	0%[1]	(0)	(0)	(0)
Pass-by Trip Percentage[2]	32.5%	(136)	(68)	(68)
Diverted Trip Percentage[2]	36.8%	(154)	(77)	(77)
Net New Trips		**130**	**65**	**65**

[1]Warehouse not open during weekday AM peak period
[2]Percentage of external trips
Source: Kittelson & Associates, Inc. 2019

5.3 PROJECT TRIP DISTRIBUTION

This section provides an overview of trip distribution percentages for the proposed Project. The distribution patterns were developed based on review of Costco Warehouse membership data, consideration of population centers and the roadway network that serves them, as well as review of existing travel patterns in the study area.

Figure G-1 in Appendix "G" shows the overall distribution pattern. As shown in the figure, the majority of site-generated trips are expected to be oriented south and east of the Project site for reasons described below.

Influence of Existing Costco Wholesale Sites

The project trip distribution pattern is influenced by the presence of multiple Costco Wholesale sites located to the south and west of Loomis including Roseville, Citrus Heights, Folsom, Cal Expo (Sacramento), Rancho Cordova and Woodland as shown in Exhibit 1.

Exhibit 1. Existing Costco Warehouse Sites

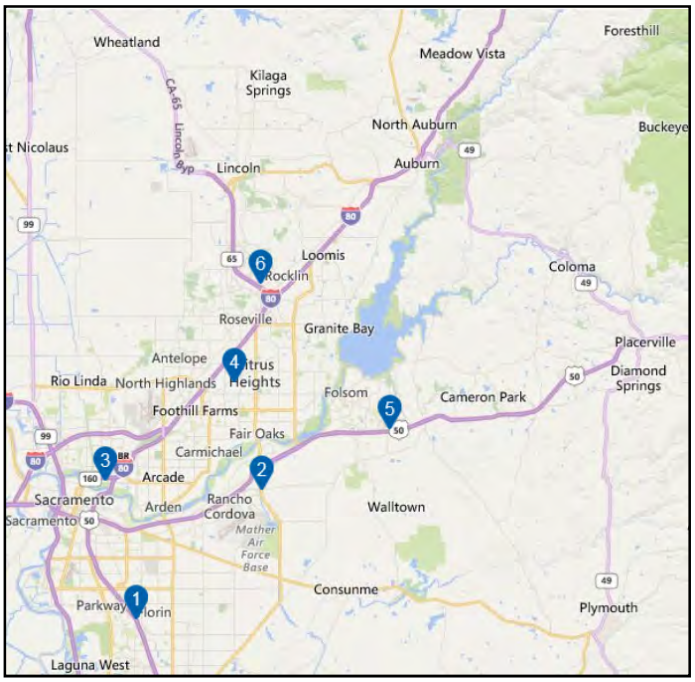


Image Source: Costco Wholesale, https://www.costco.com/warehouse-locations

Existing Costco Warehouse locations shown in Exhibit 1 are:

1. 7981 E Stockton Boulevard in Sacramento
2. 11260 White Rock Road in Rancho Cordova
3. 1600 Expo Parkway (Cal Expo) in Sacramento
4. 7000 Auburn Boulevard in Citrus Heights
5. 1800 Cavitt Drive in Folsom
6. 6750 Stanford Ranch Road in Roseville

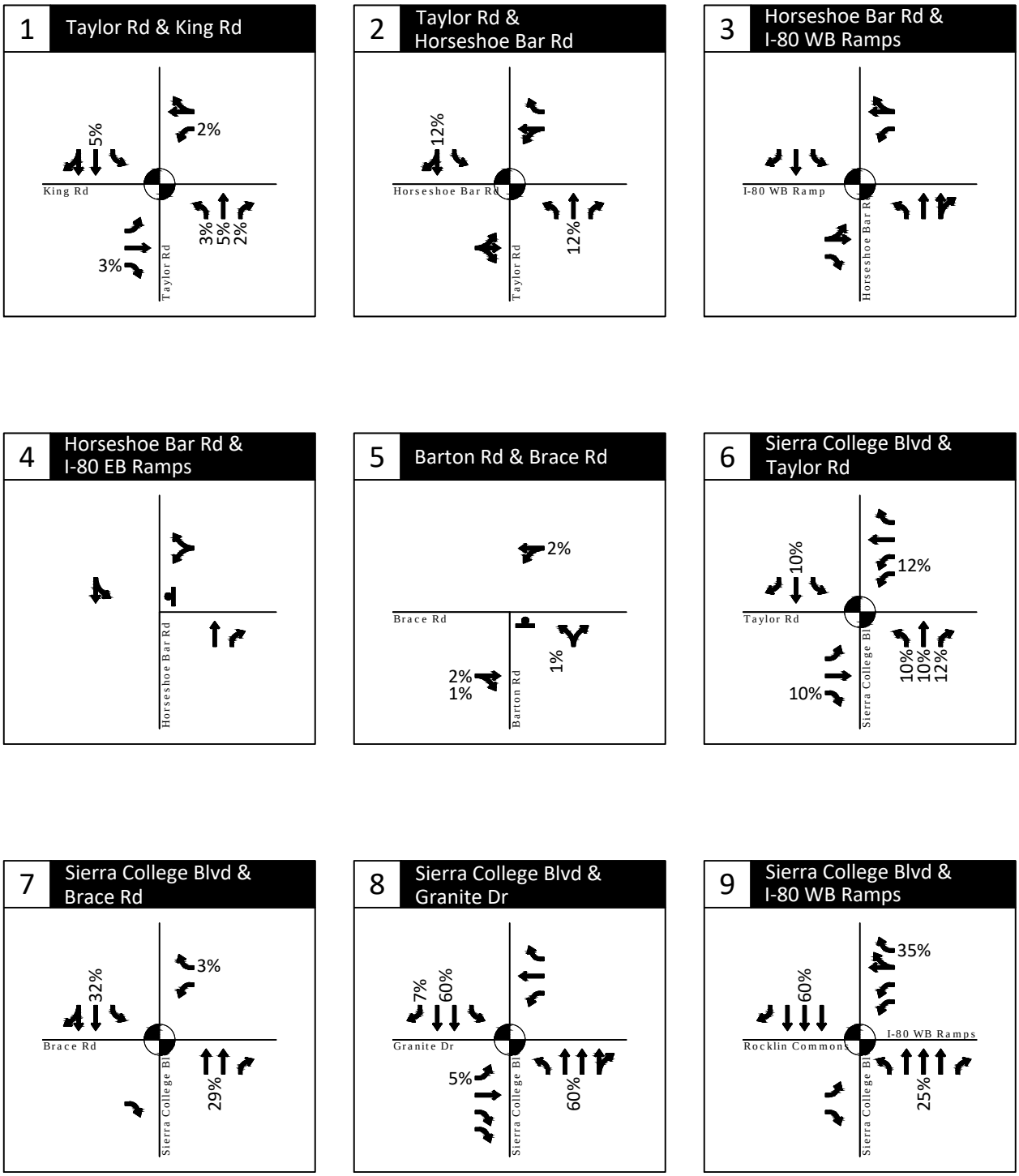
The proposed Project is situated approximately five miles east of the existing Roseville Costco Warehouse (warehouse location 6 in Exhibit 1) and is expected to impact the market area of the Roseville Costco. For example, Costco Wholesale anticipates the proposed Project will directly serve some existing Costco members residing east of the Roseville Costco Warehouse, particularly those along the I-80 corridor that currently drive past Loomis on I-80 to reach Roseville (for example, members residing in Auburn).

General Distribution Considerations

Based on the Project site location and the existing Costco Warehouses, approximately 45 percent of the Project net new site-generated trips are expected to travel to and from the Project site via I-80, including 35 percent traveling east of Sierra College Boulevard and approximately 10 percent traveling west of Sierra College Boulevard). The remaining trips were routed to Town of Loomis, City of Rocklin, and Placer County roadway facilities.

The presence of the Roseville Costco directly impacts (limits) the amount of new traffic anticipated to the proposed Project site from points to the north and west. For example, the number of project-generated trips on Sierra College Boulevard north of Taylor Road is expected to be relatively limited (approximately 10 percent) because residents of Lincoln and portions of the housing west of Sierra College Boulevard are able to access the Roseville Costco via Highway 65. Similarly, while resident population is generally denser west of Sierra College Boulevard, the number of net new trips routing on Pacific Street west of Sierra College Boulevard was estimated at 10 percent while the portion routed on Taylor Road east of Sierra College Boulevard was estimated higher at 12 percent recognizing that some residents to the west will continue to shop at the Roseville Costco.

Figure 7 presents the Project trip distribution patterns for Project Driveway Option 1A by intersection for the weekday AM peak hour for fuel trips given the warehouse is closed during this peak hour. Figure 8 presents the Project trip distribution patterns Project Driveway Option 1A by intersection for the weekday PM and weekend midday peak hours with the warehouse in operation. The trip distribution patterns were approved by the Town of Loomis and the City of Rocklin confirmed they were appropriate. Project Driveway Options 1B and 1C would affect the Project trip distribution at study intersections 7, 8, 21, 24, 25, and 37. All other study intersections would have the same trip distribution under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Figures 9 and 10 present the trip distribution patterns for Project Driveway Options 1B and 1C at those study intersections affected by the options.



##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution
Weekday AM Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
7A

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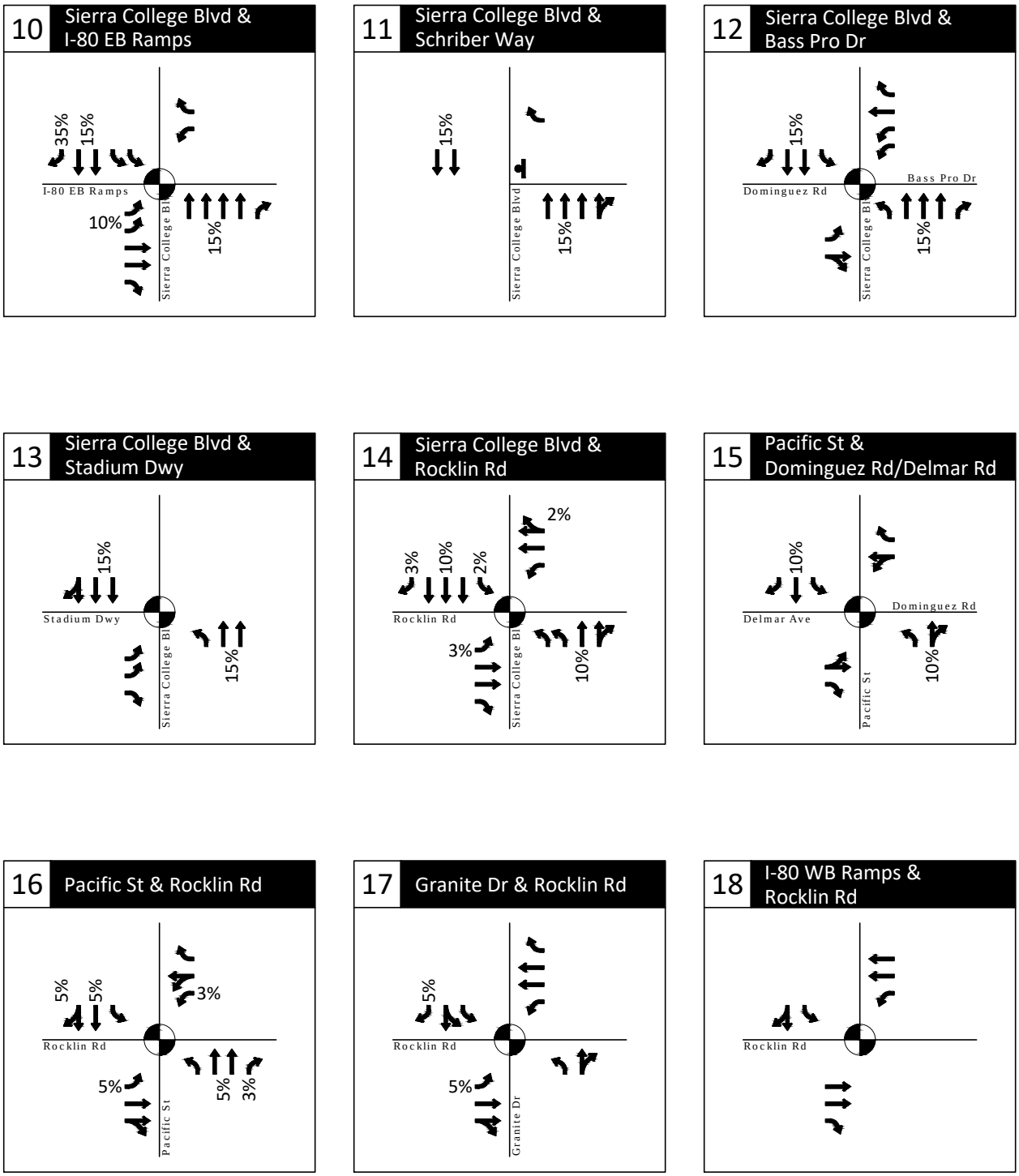
KITTELSON & ASSOCIATES



##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution
Weekday AM Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
7B

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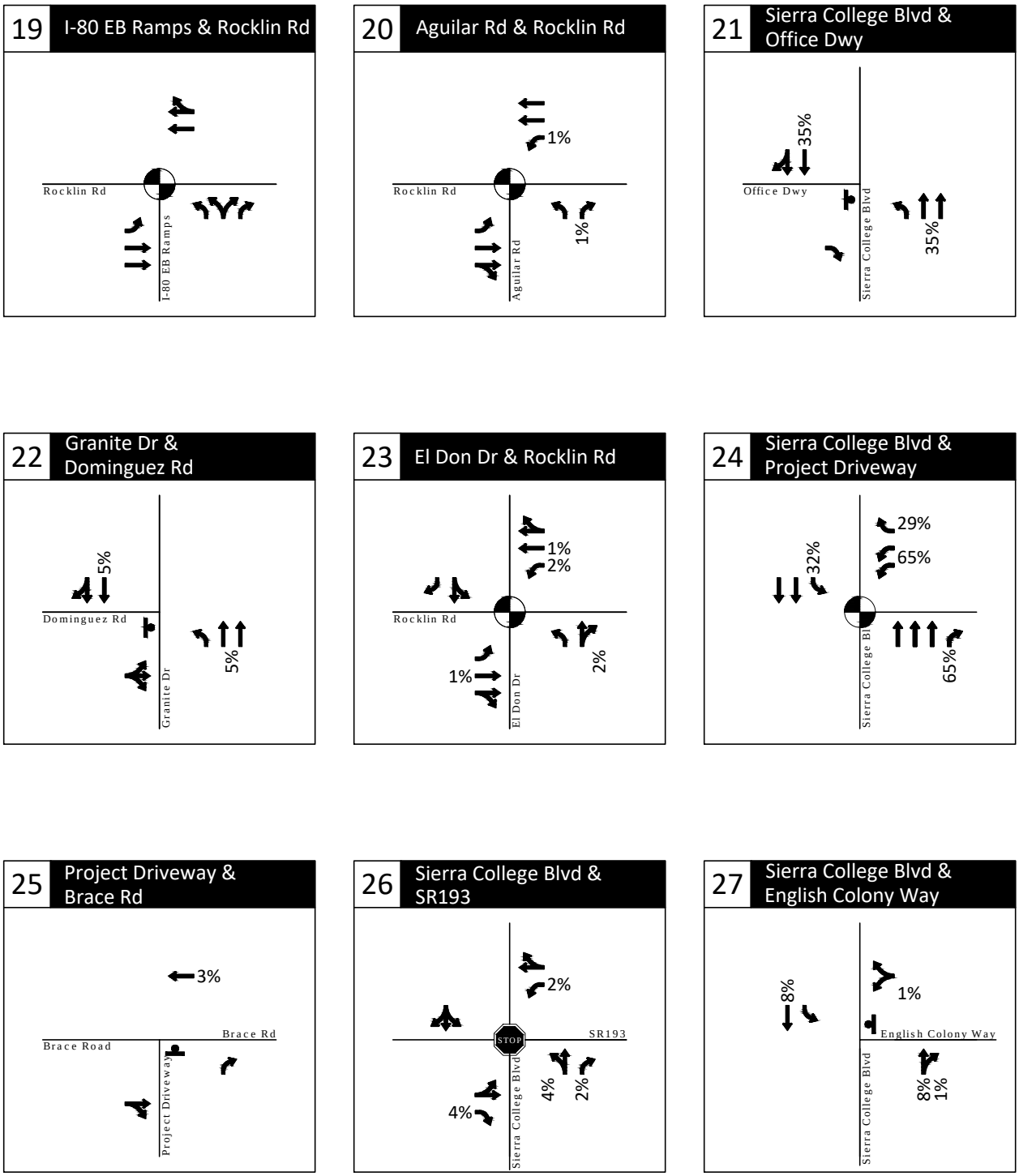
KITTELSON & ASSOCIATES



##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution
Weekday AM Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
7C

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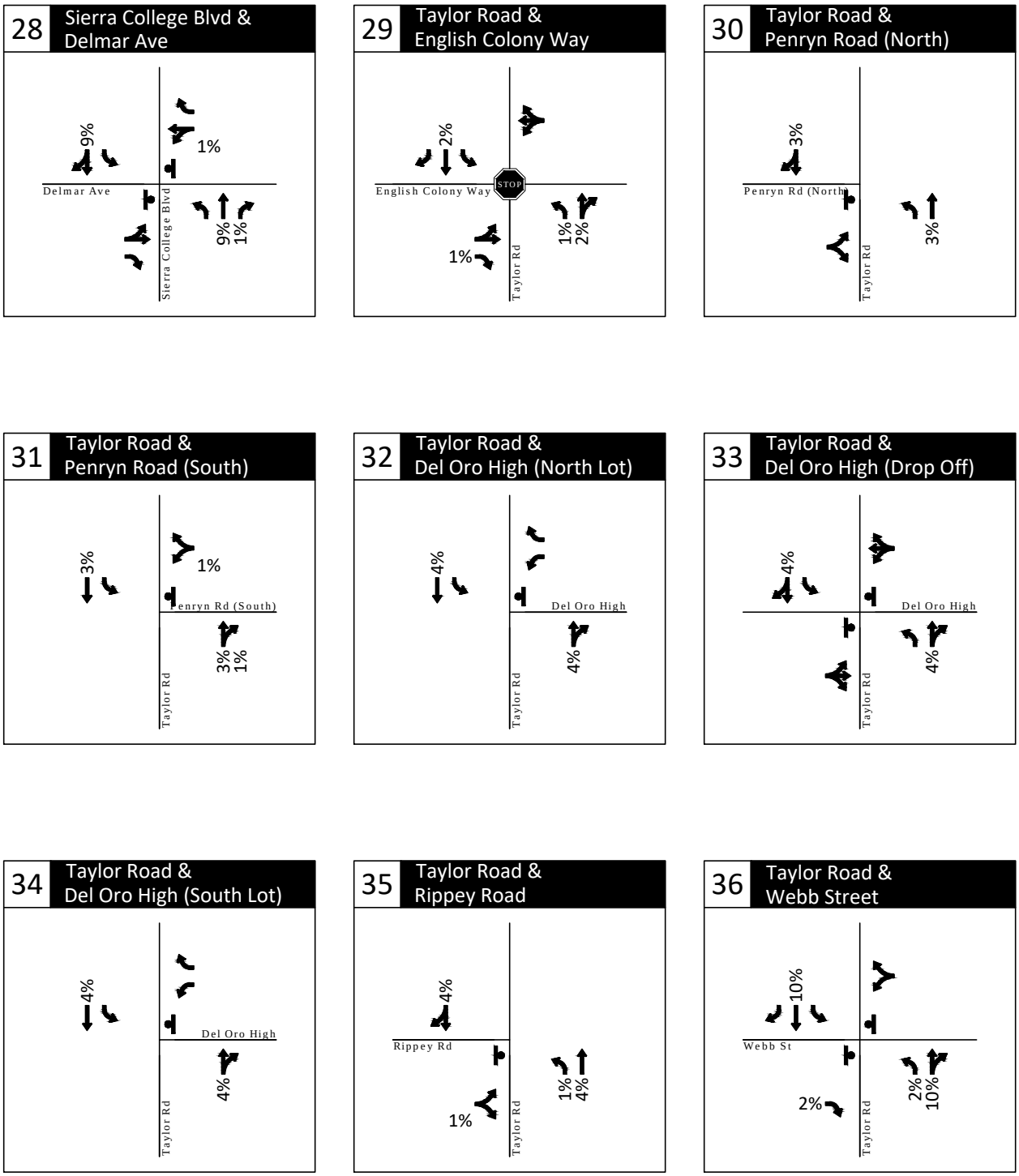

##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution
Weekday AM Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
7D

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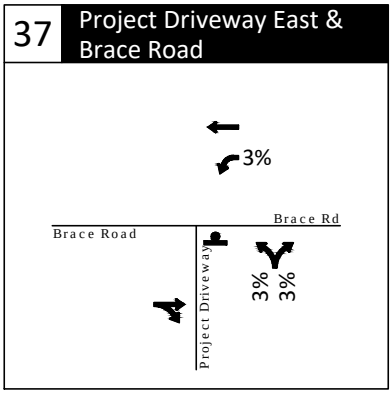

##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution
Weekday AM Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
7E

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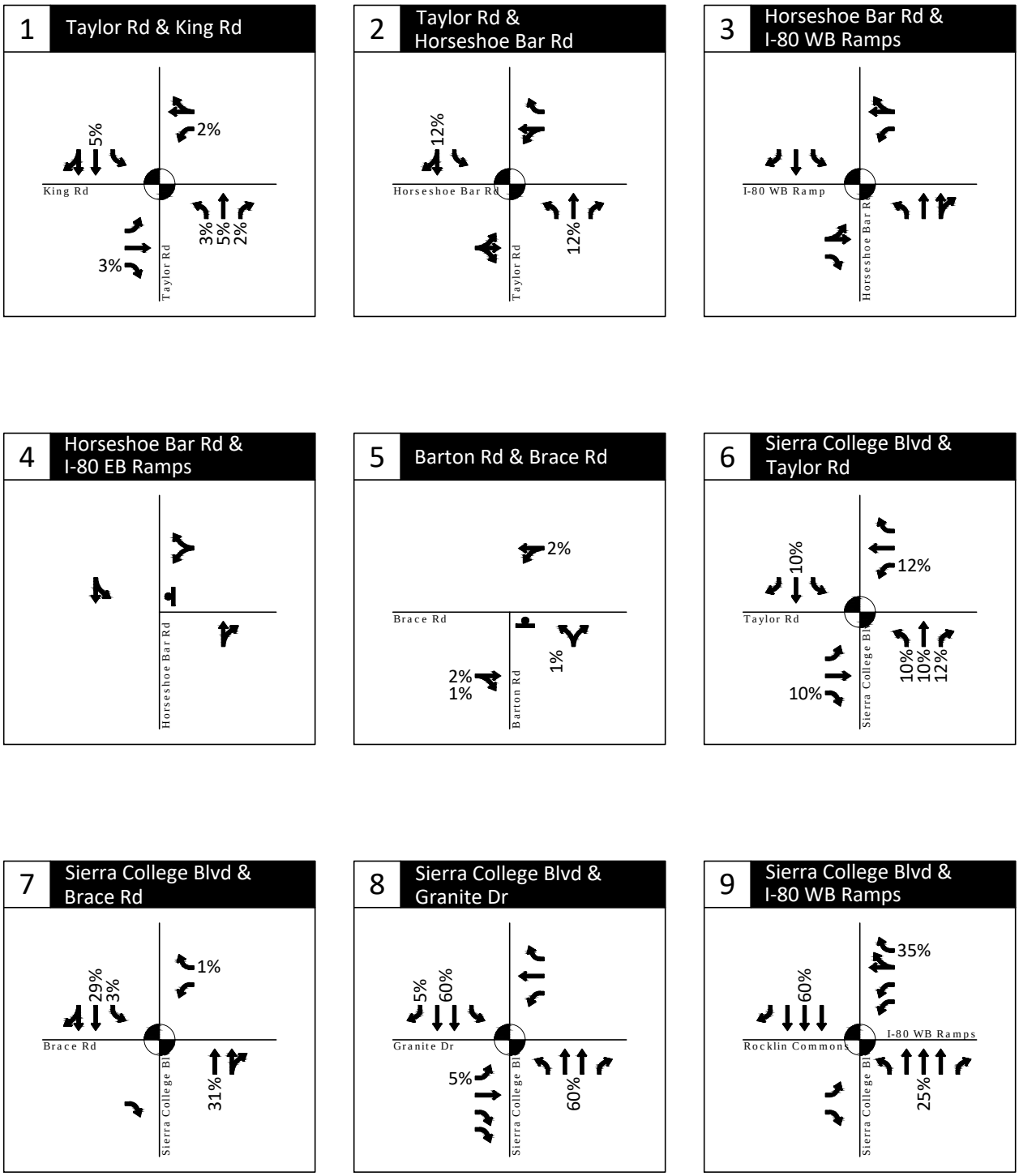

##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution Weekday PM and Weekend Midday Peak Hours - Project Driveway Option 1A
Loomis, California

Figure 8A

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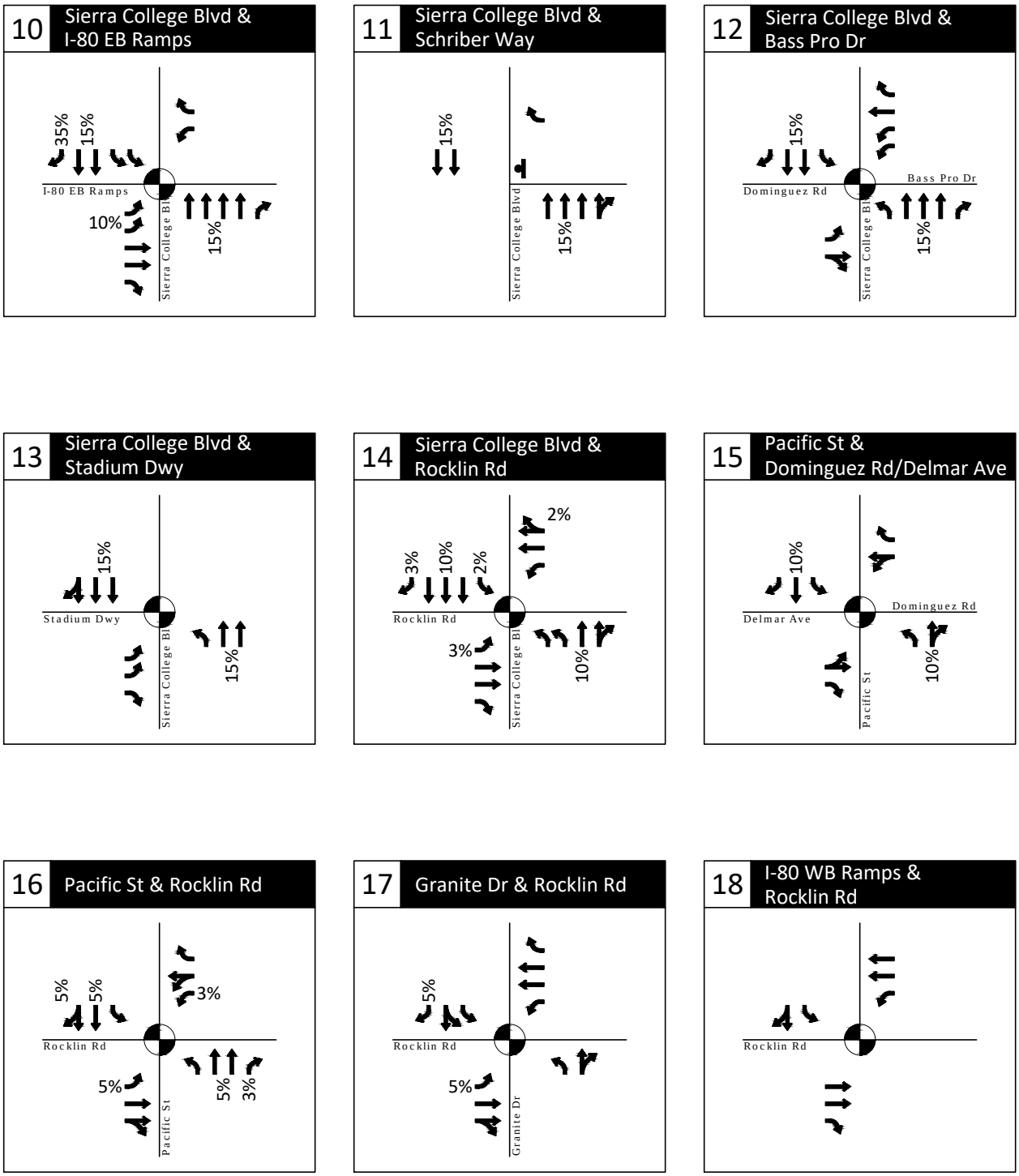

##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution Weekday PM and Weekend Midday Peak Hours - Project Driveway Option 1A
Loomis, California

Figure 8B

KITTELSON & ASSOCIATES

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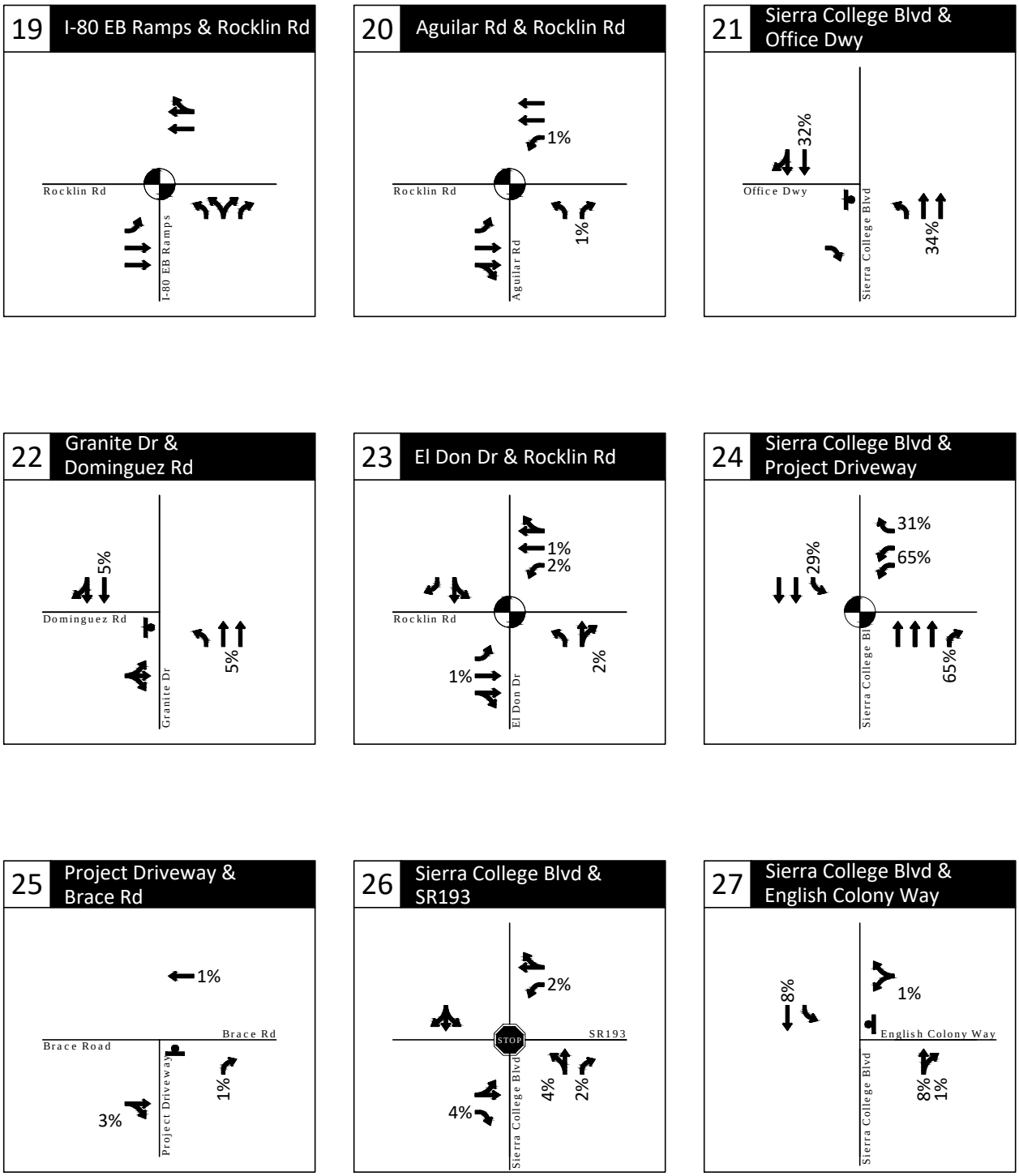

##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution Weekday PM and Weekend Midday Peak Hours - Project Driveway Option 1A
Loomis, California

Figure 8C

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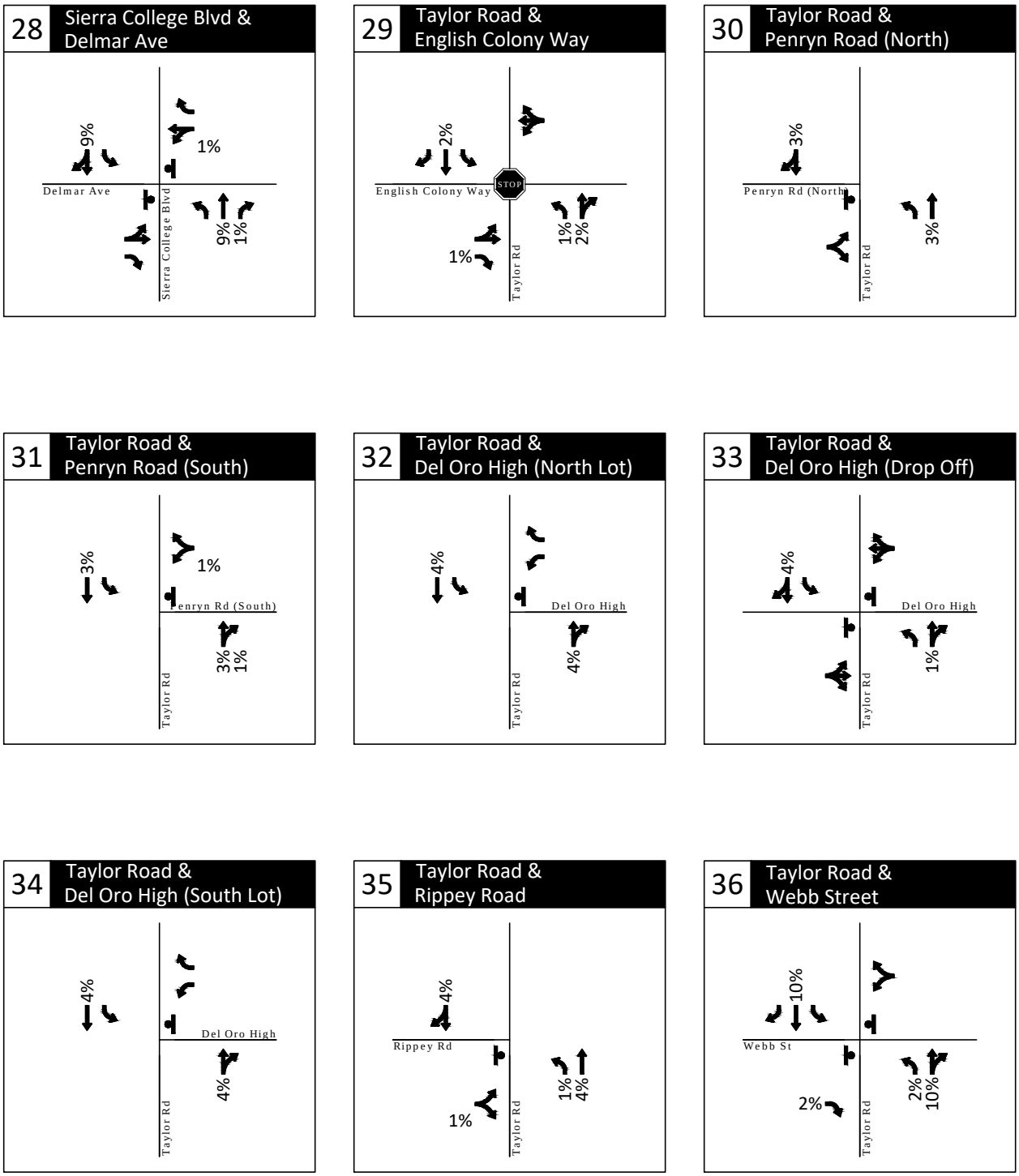


##% - Percent Trip Distribution

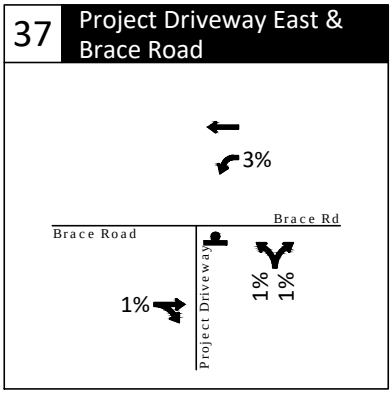
- Stop Sign

- Traffic Signal

Project Trip Distribution Weekday PM and Weekend Midday Peak Hours - Project Driveway Option 1A
Loomis, California

Figure 8D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 2:10pm - aloveday Layout Tab: TD PM_SAT D



##% - Percent Trip Distribution

- Stop Sign

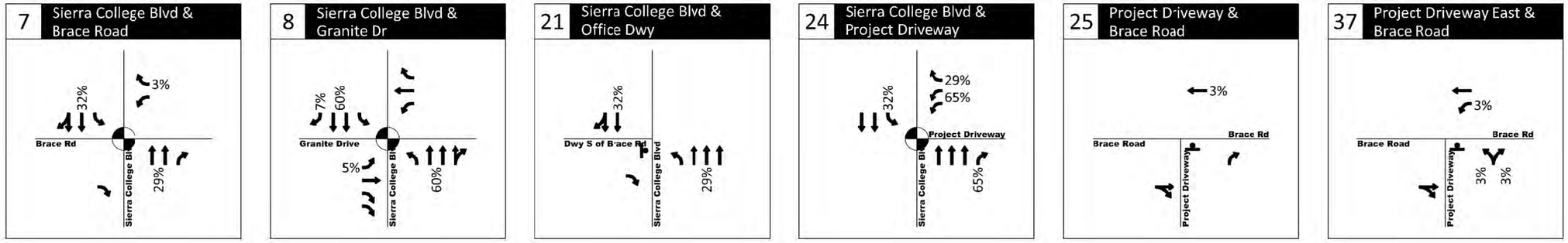
- Traffic Signal

Project Trip Distribution Weekday PM and Weekend Midday Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
8E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:52pm - aloveday Layout Tab: TD PM_SAT E

OPTION 1A



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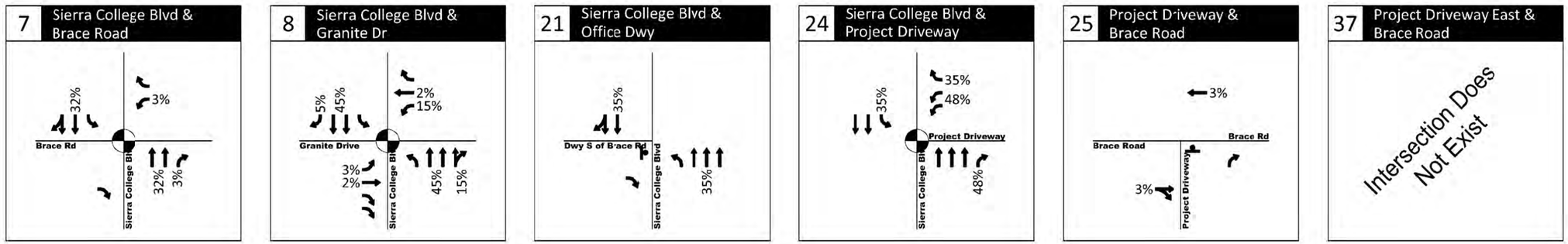
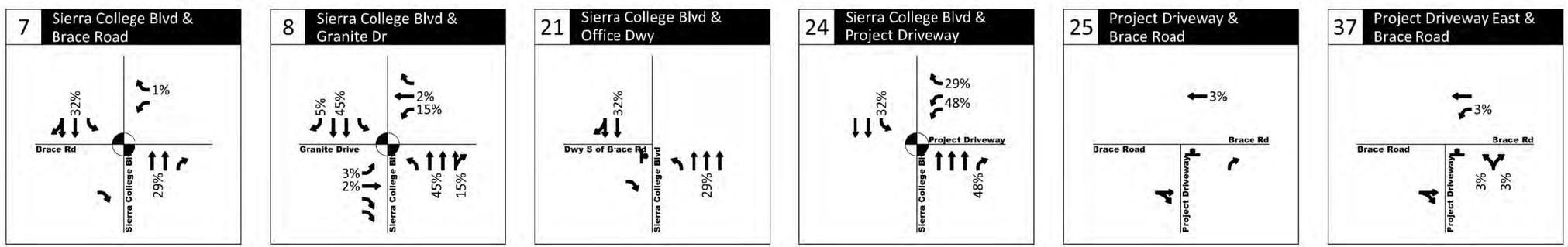


OPTION 1C



##% - Project Trip Distribution

- Stop Sign

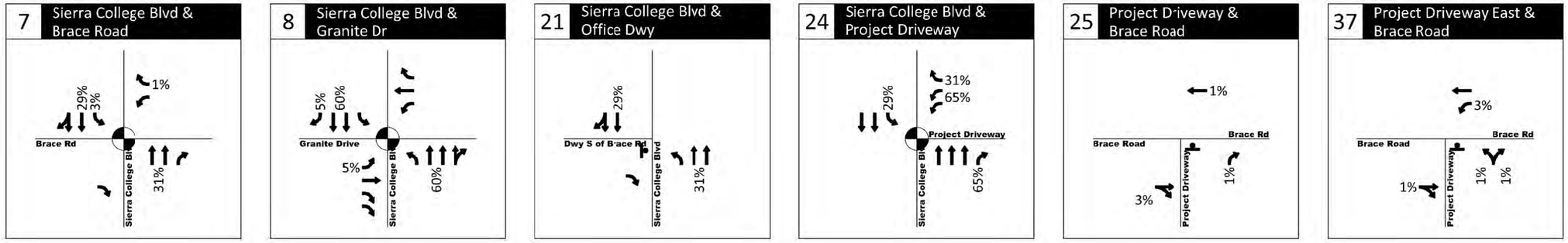
- Traffic Signal

Project Trip Distribution
Weekday AM Peak Hour
Loomis, California

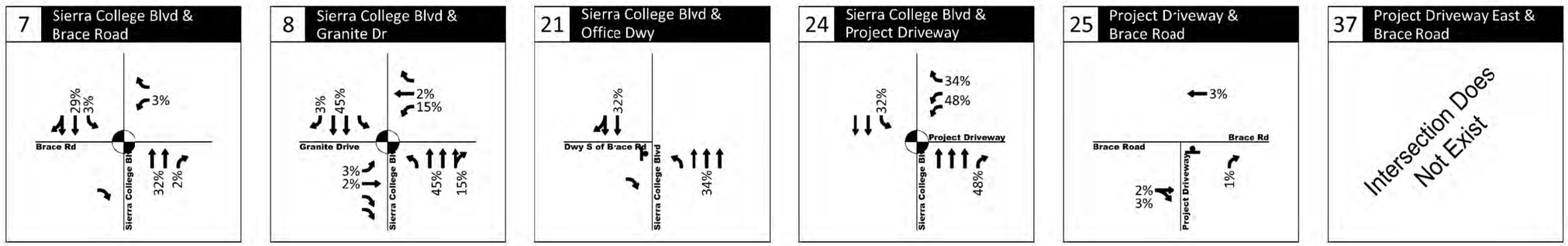
Figure
9

H:\2020345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:42pm - aloveday Layout Tab: TD_AM

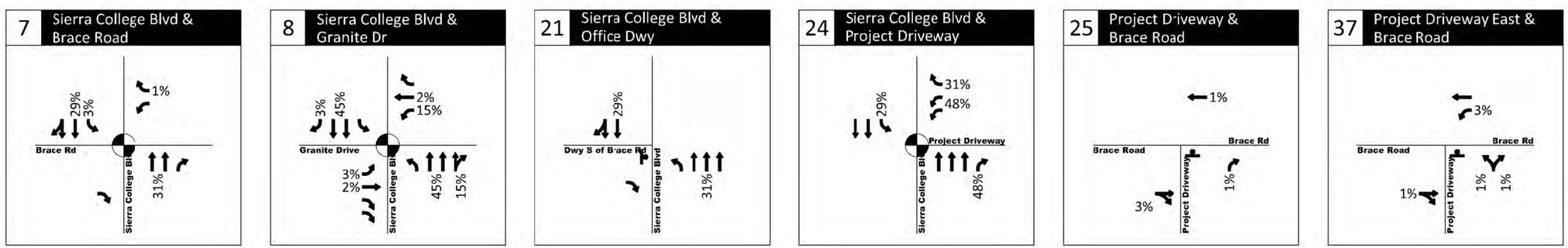
OPTION 1A



OPTION 1B



OPTION 1C



##% - Percent Trip Distribution

- Stop Sign

- Traffic Signal

Project Trip Distribution
Weekday PM & Weekend Midday Peak Hours
Loomis, California

Figure 10

H:\2020345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:41pm - aloveday Layout Tab: TD_PM_SAT

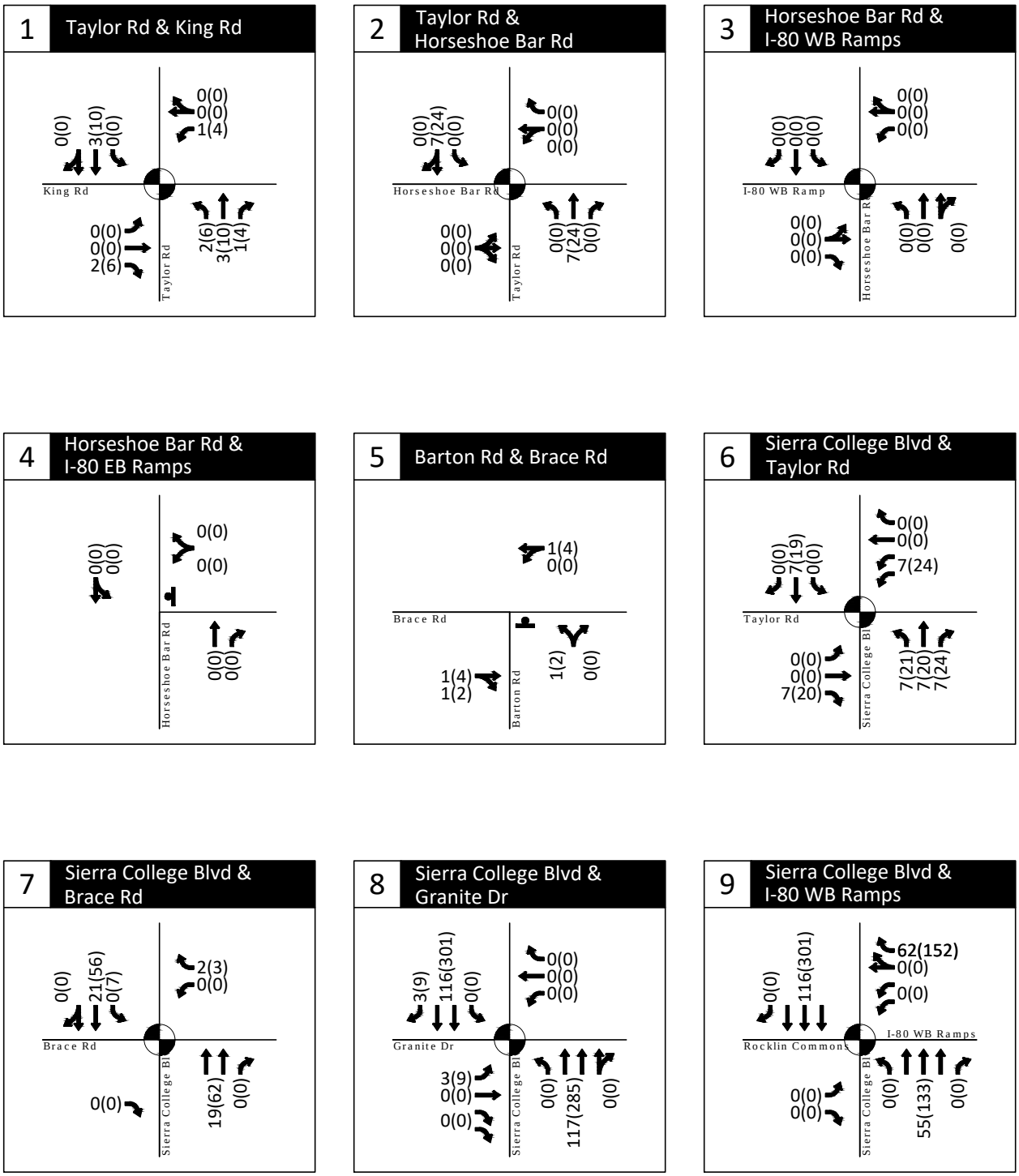
5.4 PROJECT TRIP ASSIGNMENT

This section provides the trip assignment for the proposed Project based on the trip generation and distribution patterns described above. Figures 11 and 12 present the Project trip assignment for Project Driveway Option 1A within the study area. Project Driveway Options 1B and 1C would affect the trip assignment at study intersections 7, 8, 21, 24, 25, and 37. All other study intersections would have the same trip assignment under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Figures 13 and 14 present the Project trip assignment for Project Driveway Options 1B and 1C at those study intersections affected by the options. Please note that the Project proposes a shared access with the existing apartment use at the East Project Driveway on Brace Road under Driveway Options 1A and 1C[8]. Additional figures showing an overall distribution pattern on a map as well as diverted trip assignments are provided in Appendix "G". The percent of traffic added by the Project at each study intersection is also provided in Appendix "G".

Trips were assigned to the network based on the previously described trip distribution pattern, existing turning movement patterns, and considering the proposed site access locations. Of note:

- Pass-by trips were assumed to be traveling along the Sierra College Boulevard Project site frontage prior to site development and thus only impact the Sierra College Boulevard Project site driveways.
- All diverted trips were routed between the Project site and I-80.
  - The diverted trips were analyzed as net new trips to the roadway network between the I-80 ramp intersections and the Costco site.
- Costco Wholesale anticipates the proposed Project will directly serve some existing Costco members residing east of the Roseville Costco Warehouse, including those living in Loomis and Rocklin. *No trip credits or re-routing of existing Costco member trips were made in the intersection operations analysis presented in this report.*
  - In reality, some trips currently traveling through one more of the study intersections traveling to and from the Roseville Costco site will likely divert to the new site.
  - Assuming all of the Costco member trips are new to the study intersections provides a more conservative analysis.

[8] Due to the shared access arrangement between the Costco site and the existing apartments under Driveway Options A and C, some apartment trips will use the East Project Driveway on Brace Road. Apartment trips at the shared access were estimated for the 28-unit apartment building using apartment trip rates in the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers in 2017 (documentation provided in Appendix G). The estimated apartment trips were assigned to the East Project Driveway based on the direction split of volumes along Brace Road.



AM(PM) - Weekday Traffic Volume

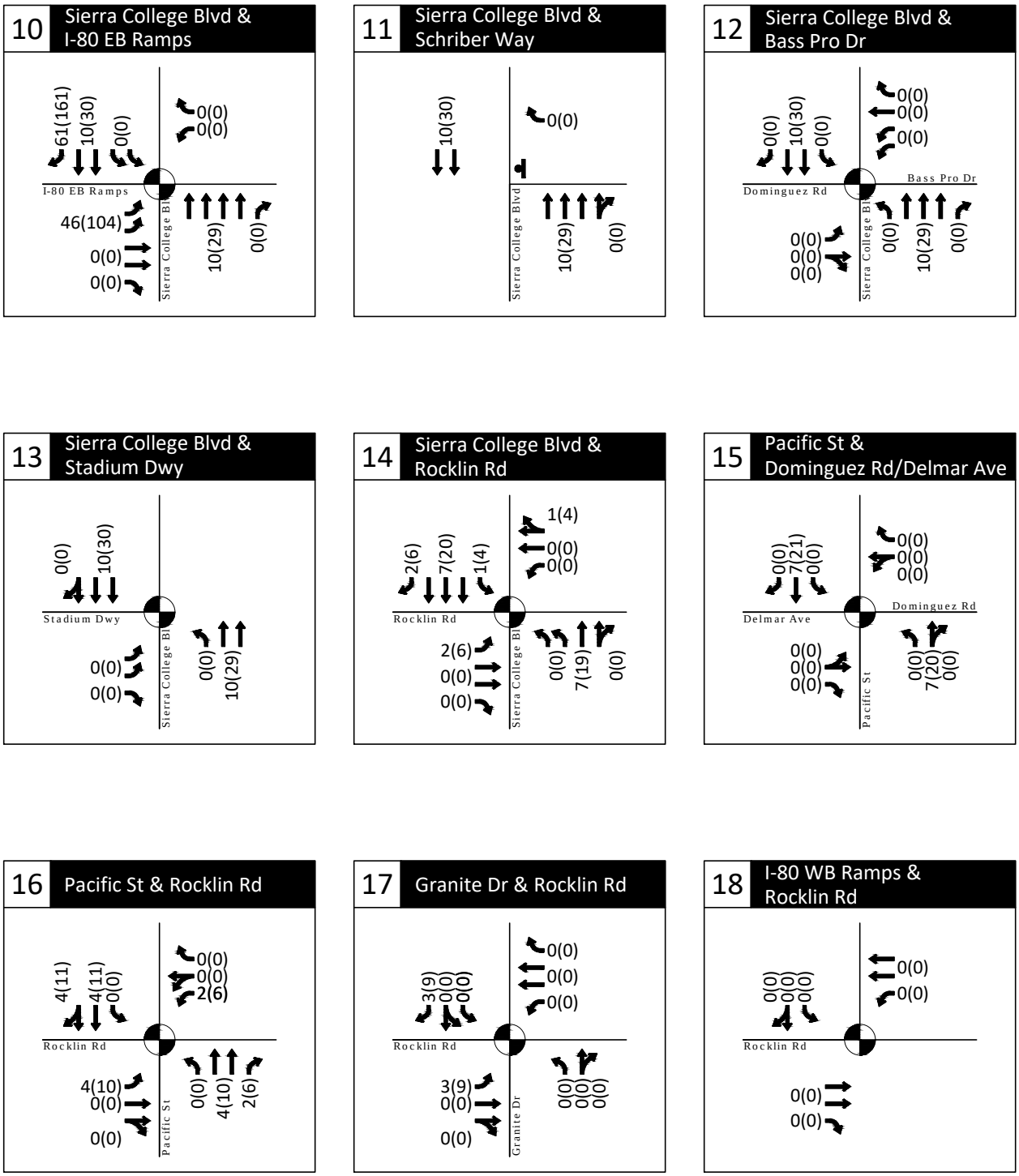
- Stop Sign

- Traffic Signal

Project Trip Assignment
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
11A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 2:25pm - aloveday Layout Tab: PO AM_PM A



AM(PM) - Weekday Traffic Volume

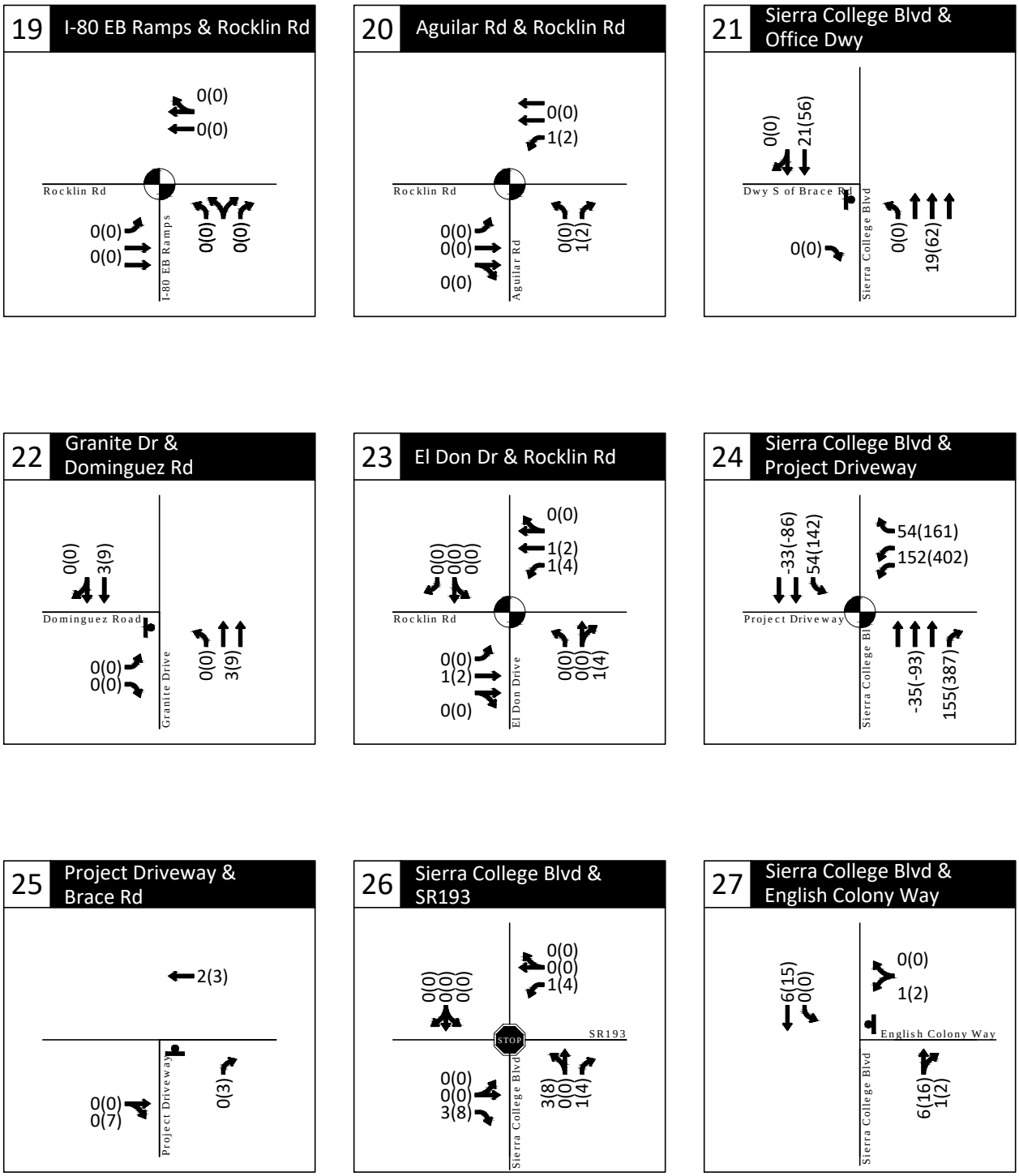
- Stop Sign

- Traffic Signal

Project Trip Assignment
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
11B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 2:25pm - aloveday Layout Tab: PO AM_PM B



AM(PM) - Weekday Traffic Volume

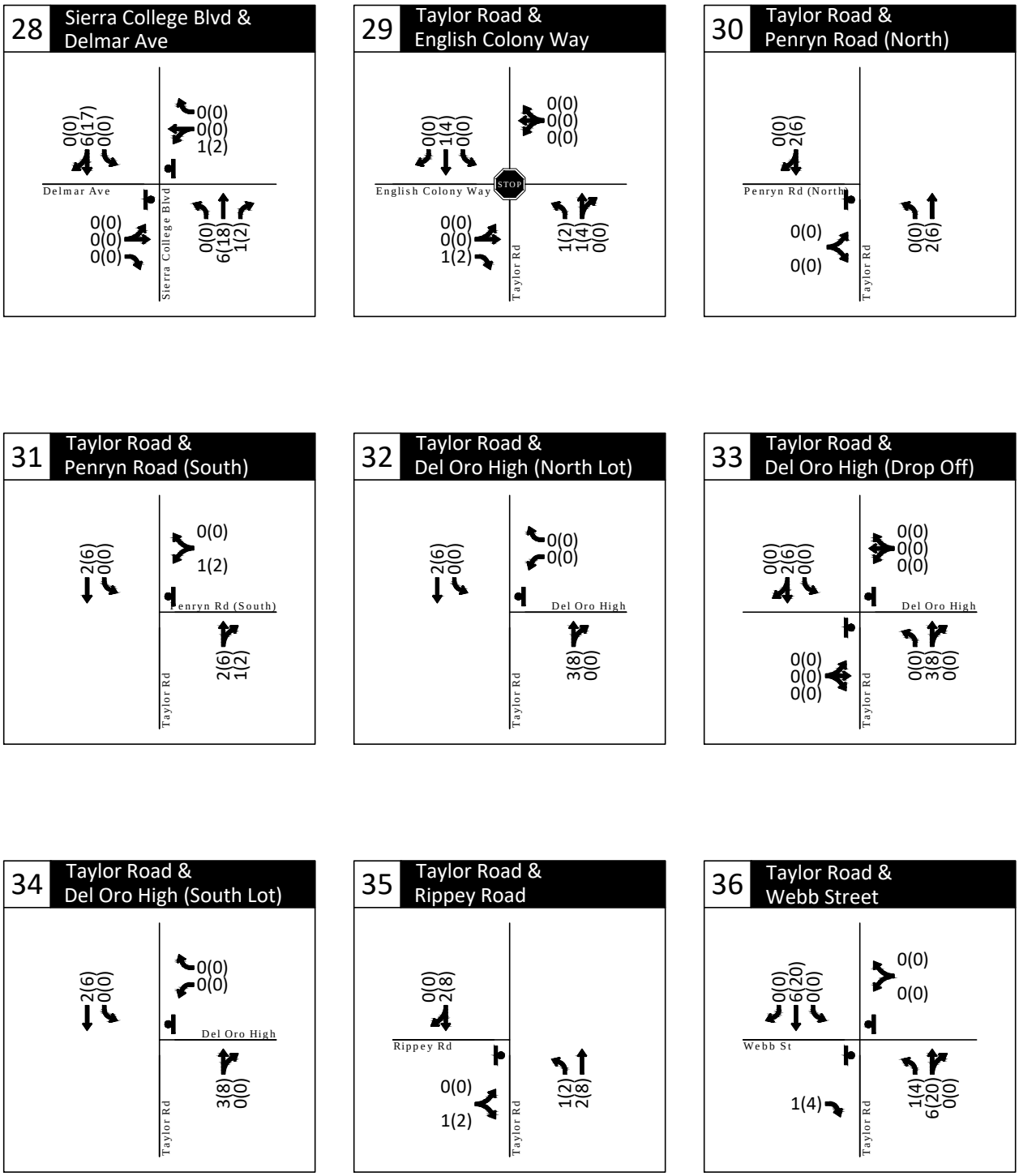
- Stop Sign

- Traffic Signal

Project Trip Assignment
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
11C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 2:25pm - aloveday Layout Tab: PO AM_PM C



AM(PM) - Weekday Traffic Volume

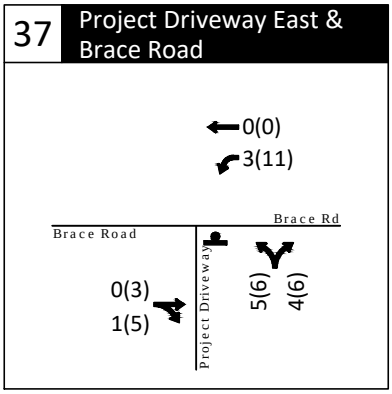
- Stop Sign

- Traffic Signal

Project Trip Assignment
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
11D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 2:26pm - aloveday Layout Tab: PO AM_PM D



Note: Intersection #37 volumes includes trips to the adjacent apartment use to account for shared access at the proposed driveway.

AM(PM) - Weekday Traffic Volume

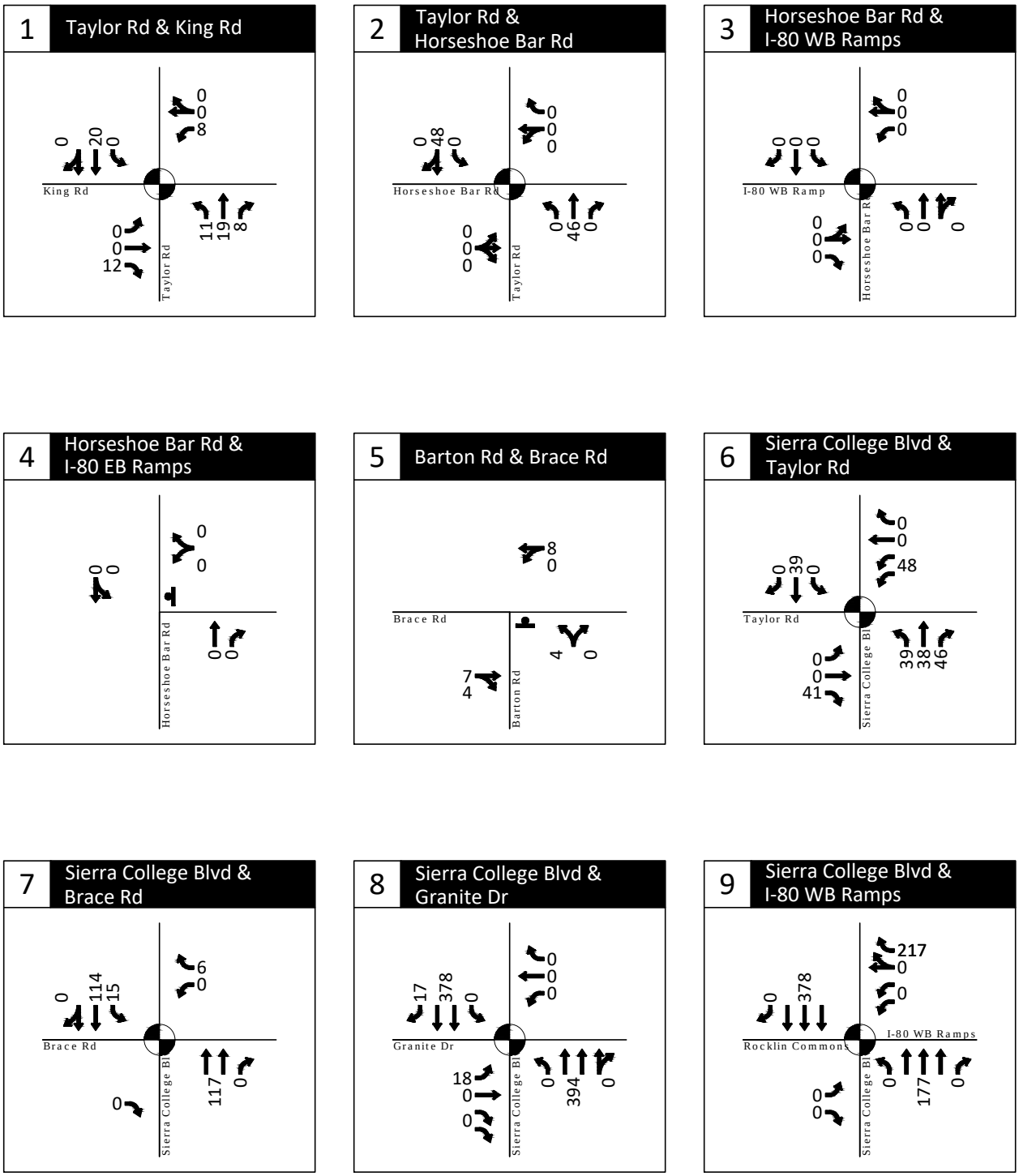
- Stop Sign

- Traffic Signal

Project Trip Assignment
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
11E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:53pm - aloveday Layout Tab: PO AM_PM E



- Weekend Midday Traffic Volume

- Stop Sign

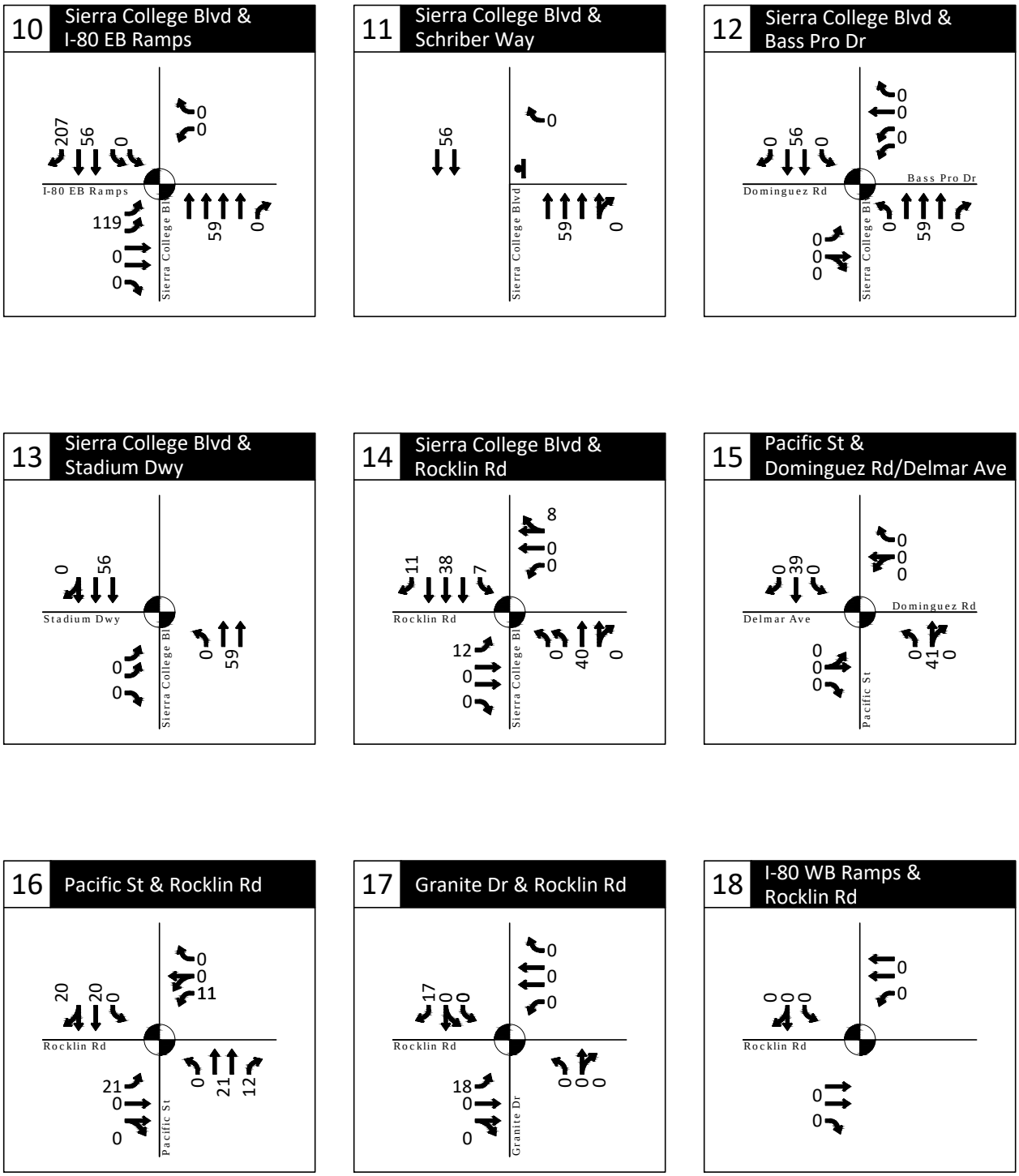
- Traffic Signal

Project Trip Assignment
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
12A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:09pm - aloveday Layout Tab: PO SAT A

KITTELSON & ASSOCIATES



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

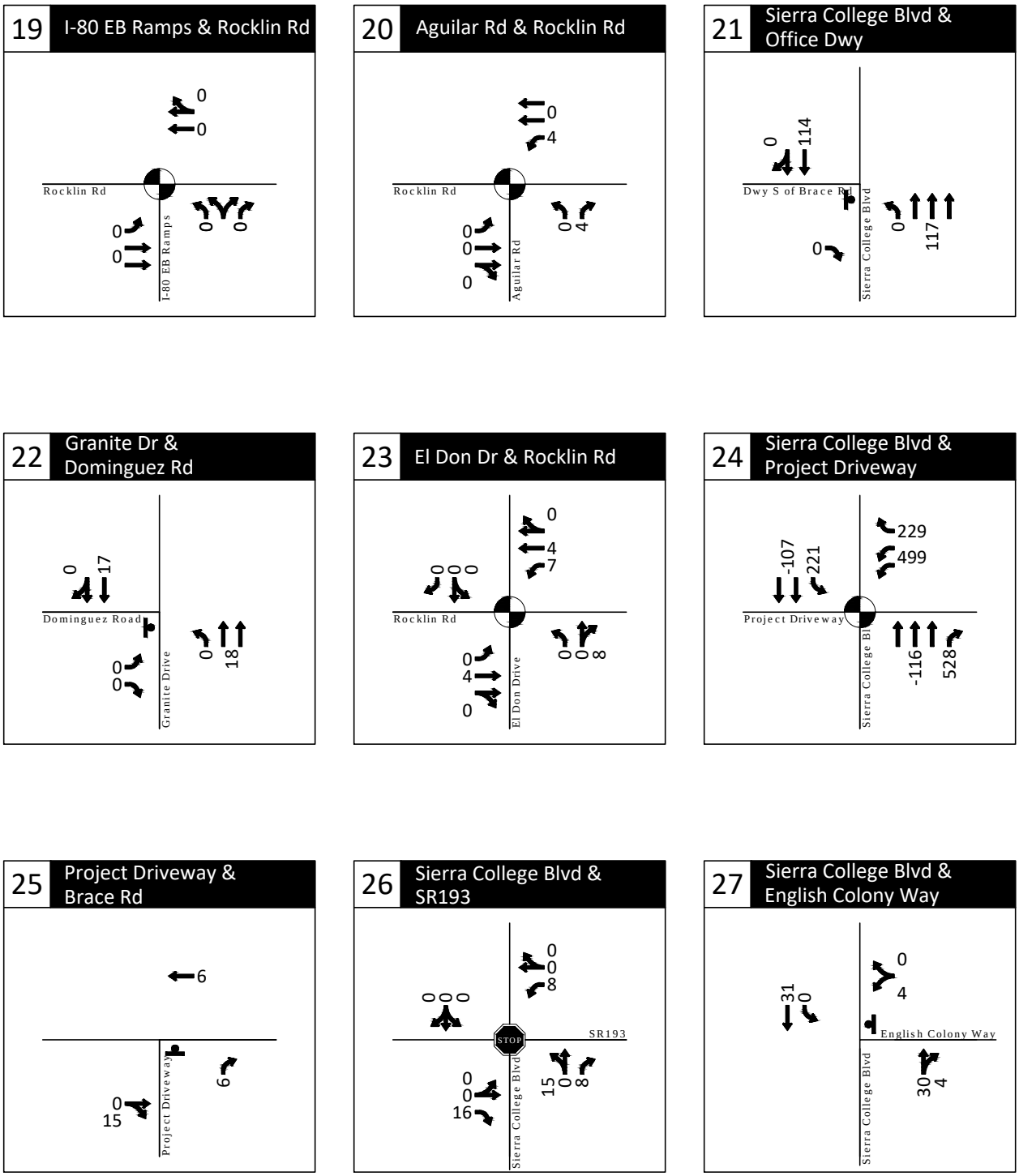
Project Trip Assignment

Weekend Midday Peak Hour - Project Driveway Option 1A

Loomis, California

Figure 12B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:09pm - aloveday Layout Tab: PO SAT B



- Weekend Midday Traffic Volume

- Stop Sign

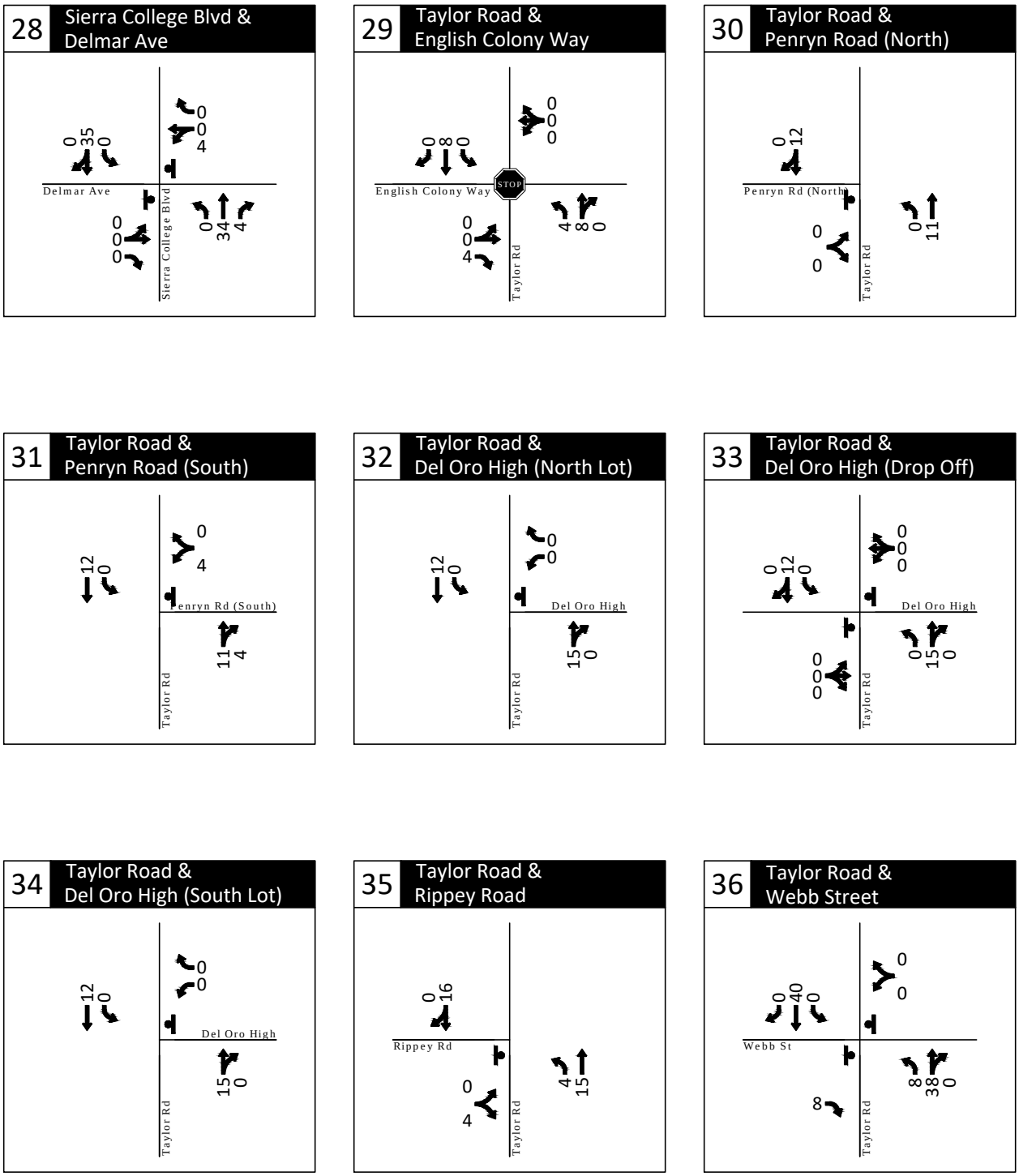
- Traffic Signal

Project Trip Assignment
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
12C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:09pm - aloveday Layout Tab: PO SAT C

KITTELSON & ASSOCIATES



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

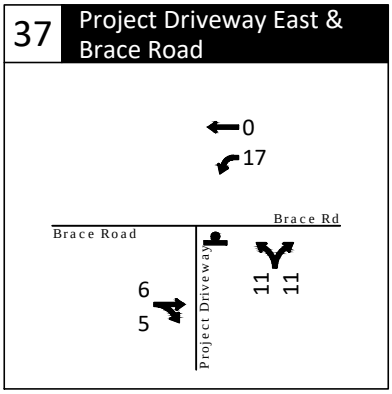
Project Trip Assignment

Weekend Midday Peak Hour - Project Driveway Option 1A

Loomis, California

Figure 12D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:09pm - aloveday Layout Tab: PO SAT D



Note: Intersection #37 volumes includes trips to the adjacent apartment use to account for shared access at the proposed driveway.

- Weekend Midday Traffic Volume

- Stop Sign

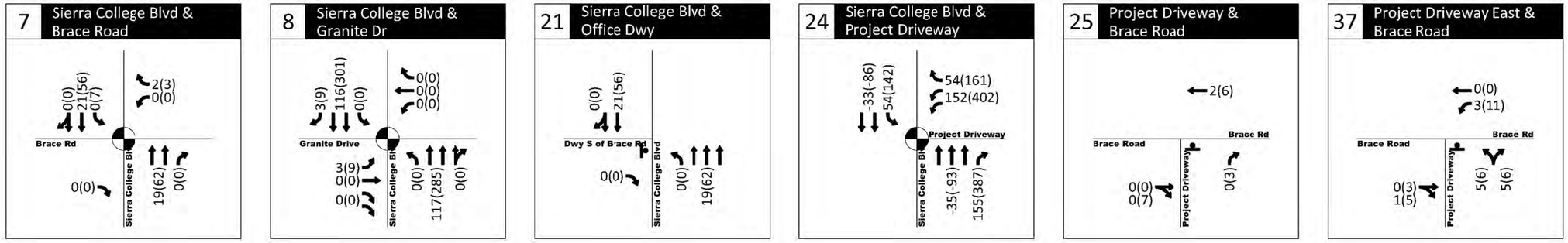
- Traffic Signal

Project Trip Assignment
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

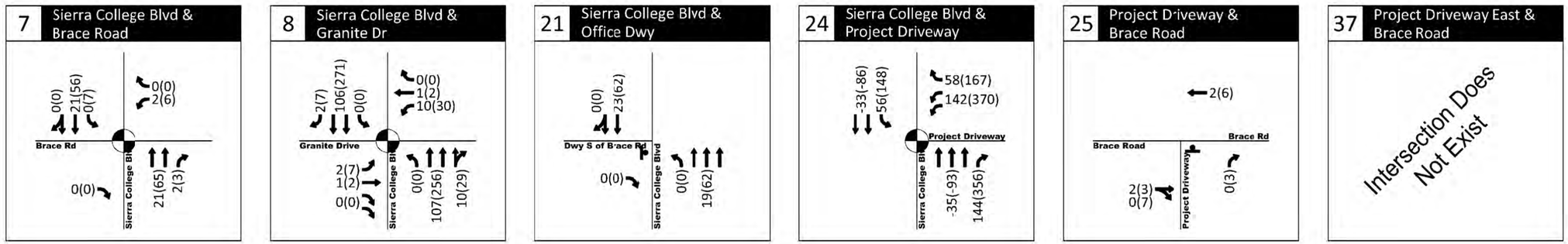
Figure
12E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:53pm - aloveday Layout Tab: PO SAT E

OPTION 1A



OPTION 1B



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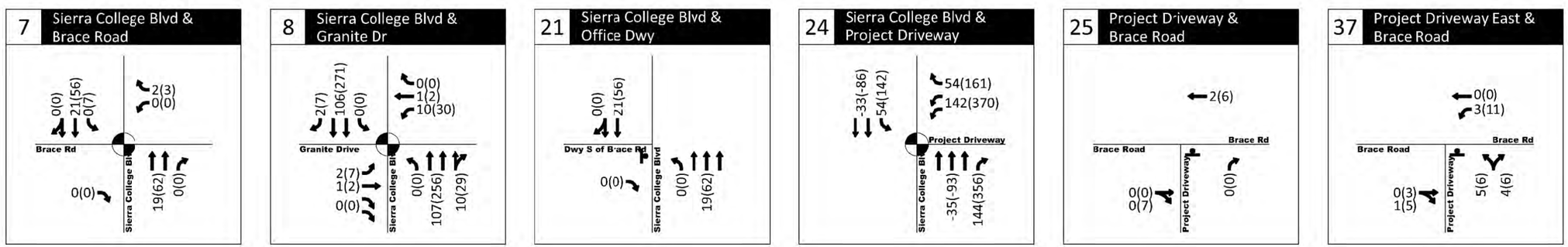


AM(PM) - Weekday Traffic Volume

- Stop Sign

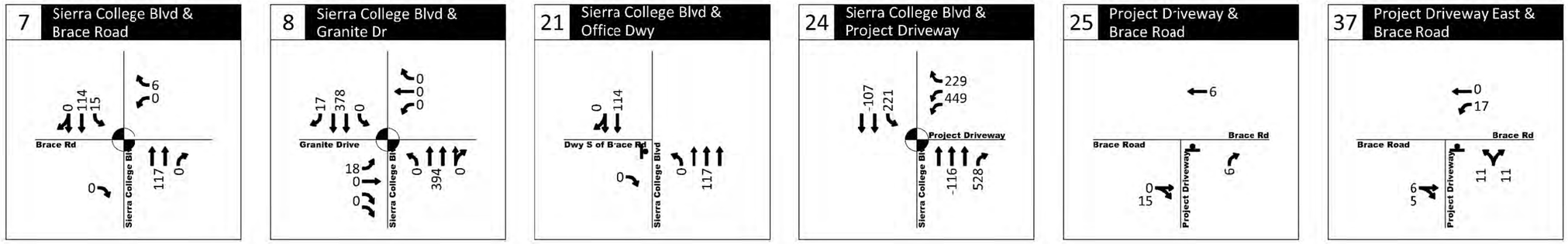
- Traffic Signal

Project Trip Assignment
Weekday AM & PM Peak Hours - Project Driveway Option 1B & 1C
Loomis, California

Figure 13

H:\2020345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:40pm - aloveday Layout Tab: PO AM_PM

OPTION 1A



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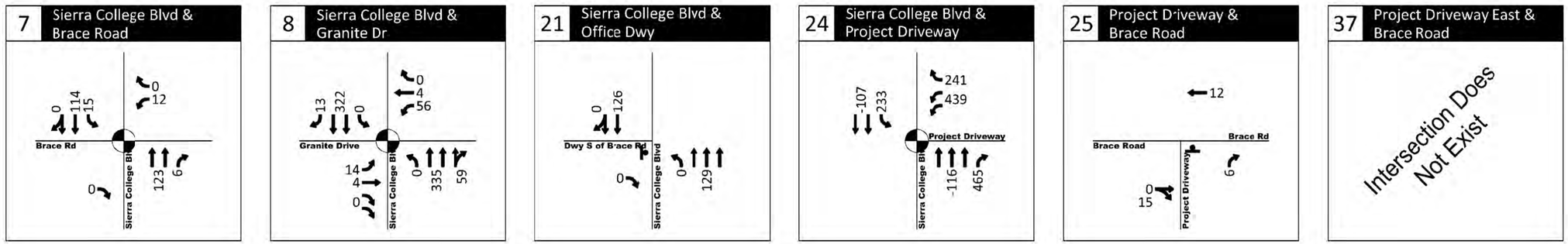
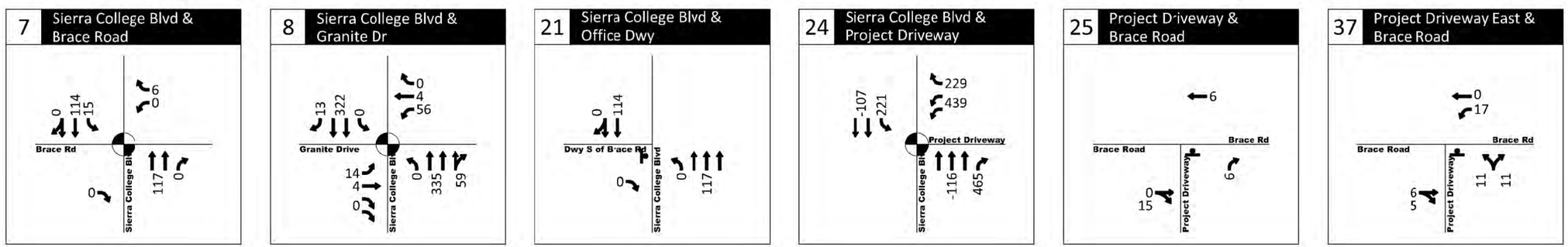


OPTION 1C



- Weekend Traffic Volume
- Stop Sign
- Traffic Signal

Project Trip Assignment
Weekend Midday Peak Hour - Project Driveway Option 1B & 1C
Loomis, California

Figure 14

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5.5 TRUCK DELIVERY CONSIDERATIONS

As described in Section 5.1 of this report, publicly accessible driveways are proposed to serve the Project site.

The right-in/right-out Brace Road driveway was designed to serve Costco members as well as deliveries. Warehouse delivery trucks would enter the Project site via Brace Road, complete the delivery and subsequently exit the site at the new signalized Project access along Sierra College Boulevard for each of the three Project driveway options evaluated in this study. The proposed northbound right-turn lane on Sierra College Boulevard at Brace Road will facilitate truck entry.

Costco Gasoline delivery trucks would enter and exit the site via the new signalized Project access along Sierra College Boulevard for Project Driveway Option 1A, completing a counter-clockwise rotation through the Project site. Project Driveway Options B and C would route the Costco Gasoline truck into the Project site via the new signalized Project access along Sierra College Boulevard and would involve an exit path to Granite Drive. Similar to the Brace Road delivery truck access route, the proposed northbound right-turn lane on Sierra College Boulevard at the Project access will facilitate Costco Gasoline truck entry for all three Project driveway options.

On-site circulation was evaluated for adequate maneuverability for passenger vehicles as well as delivery trucks and emergency vehicles. The AutoTurn software application was used to evaluate maneuverability of larger trucks throughout the site as shown on the site plan as shown in Figure 6D. The Project access driveways have adequate widths and curve radii to accommodate delivery trucks and member vehicles.

Adequate sight lines should be provided at the internal intersections and site access points to provide conformance with Town of Loomis standards.

Warehouse Deliveries

Costco anticipates an average of about 10-13 Costco trucks a day delivering goods to the Costco Warehouse. The Costco trucks typically measure up to approximately 70 feet long for double-axle trailers. Typical receiving time is from 2:00 AM to 1:00 PM, averaging two to three trucks per hour, with most of the deliveries completed before the 10:00 AM warehouse opening time. Deliveries to the warehouse are made primarily in Costco trucks from its freight consolidation facility in Tracy, California. In addition to the Costco depot trucks, deliveries such as bread are expected to be made by local vendors using single unit trucks and/or single-axle trailers.

Costco Gasoline Deliveries

Costco anticipates that the Costco Gasoline fuel station will receive five to seven fuel deliveries per day on average. During busy holiday weeks, an additional delivery is often required during the day. These deliveries occur any time between 6:00 AM and 7:00 PM.

5.5.1 Costco Gasoline Site Queuing Needs

The proposed site plan locates the proposed inbound (one-way) access to the Costco Gasoline fuel station approximately 155 feet east of Sierra College Boulevard (measured from Sierra College Boulevard curb to west driveway curb) along the Project entrance within the Project site. On-site queuing associated with the Costco Gasoline area was assessed to determine whether fuel station operations would impact the Project entrance as described below.

Costco Fuel Station Operations

By way of introduction, Costco Gasoline fuel stations all function as ancillary uses to the main Costco warehouses that share their sites. The fuel stations can only be accessed by members and require a Costco membership card to activate the pumps for dispensing gasoline. Payment can only be made with a credit card and, unlike traditional gas/service station operations, there are no other automotive services (such as repairs) or other type of sales (including food or sundries) associated with the Costco Gasoline fuel station. All Costco Gasoline fuel stations have a minimum of one attendant working during all operating times who is responsible for expediting members' use of the fuel pumps, directing entering vehicles to open pump locations, and managing on-site queues from the pumps.

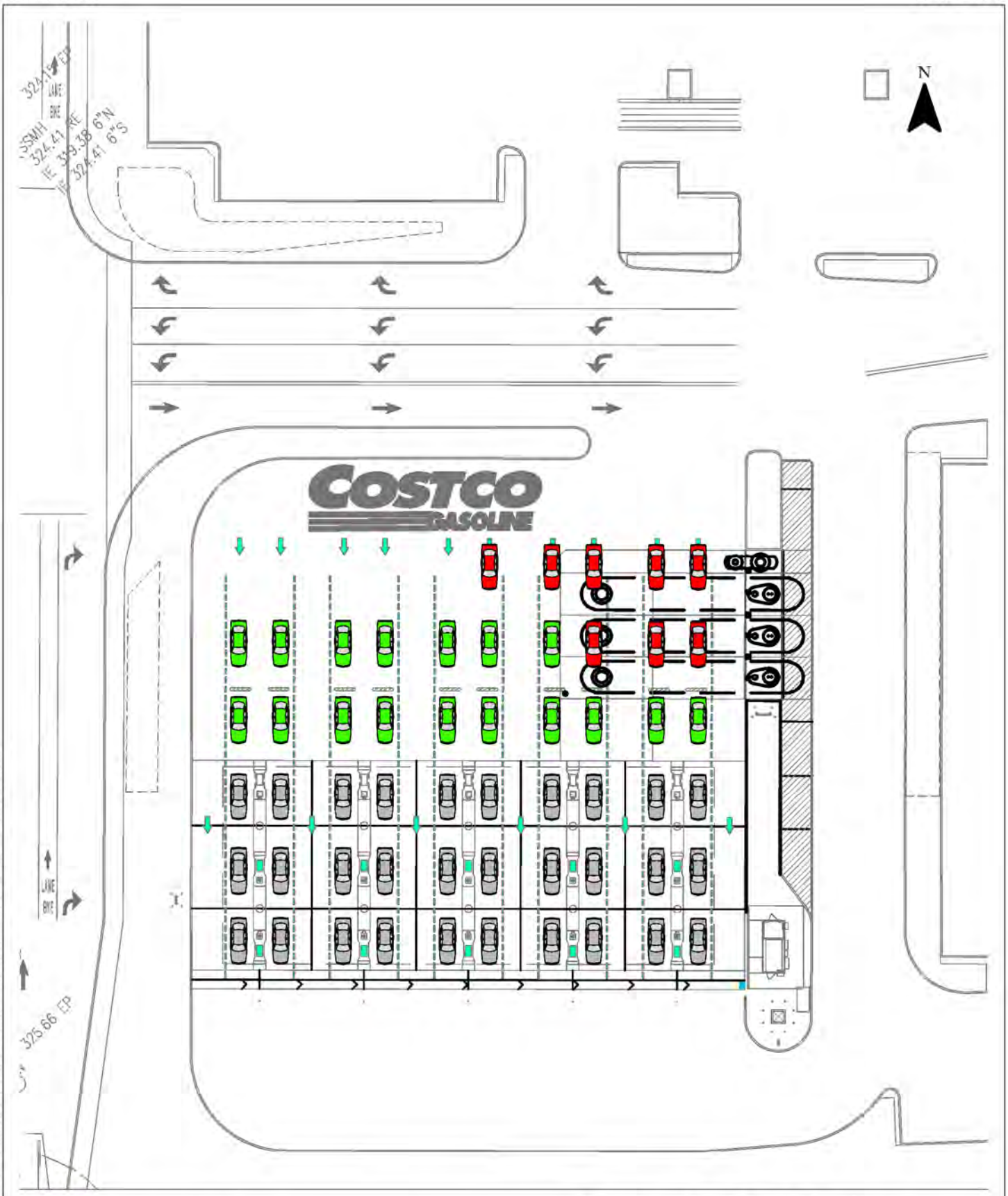
On-Site Queuing

The proposed Costco Gasoline fuel station area at the Loomis site would initially provide five islands (10 fueling aisles) with four fueling positions each, offering a total of 20 fueling positions where vehicles can simultaneously purchase fuel. The site plan is expandable, adding a third row of fuel dispensers that would result in a total of 30 fueling positions.

Based on the current site plan, the queueing area beyond the pumps extending toward the primary entry aisle from Sierra College Boulevard measures approximately 80 feet, assuming all 30 fuel dispensers are in operation.

Vehicular queuing data has been collected at other representative Costco Gasoline fuel station sites to provide reliable information related to the anticipated queues for the proposed facility. Table 14 summarizes the five comparable locations[9].

[9] Queuing data was collected in 2016 and 2017 at Costco Gasoline sites each having 24 fueling positions (largest fuel facility sites with available data). The locations shown represent the largest and busiest Costco Gasolines in California for which data is available as well as a site in Portland, Oregon that has the highest Costco sales in the state (in part reflecting proximity to nearby Washington State where sales and fuel taxes are higher). Therefore, they are considered representative of the Project's fuel station.



- 50th Percentile Queue
- 95th Percentile Queue

Each vehicle assumed to occupy 25 feet.

Costco Gasoline Fuel Station Queueing (Weekend Peak)
Loomis, California

Figure 15

H:\20\28545 - Confidential Loomis Costco\dwgs\figs\20345_Fig1.dwg Oct 22, 2019 - 4:42pm - aloveday Layout Tab: Layout1

Observed queues were reported for maximum, average, and 95th percentile scenarios during both the weekday PM peak hour and during a weekend midday peak. The 95th percentile queue is defined to be the queue length (in vehicles) that has only a 5-percent probability of being exceeded during the analysis time period. The industry standard methodology for queuing analysis considers the 95th percentile queues.

Table 14: Costco Gasoline Queuing Observations

Location	Dates Collected	Size (pumps)	Weekday PM Peak Queue					Weekend Midday Peak Queue				
			Volume	Min	Max	Average	95th	Volume	Min	Max	Average	95th
Tustin II, CA	7/28/16 & 7/30/16	22	662	11	35	26	34	610	14	38	29	35
Rohnert Park, CA	8/18/16 & 8/20/16	24	498	0	8	3	7	632	0	22	8	16
Concord, CA	8/25/16 & 8/27/16	24	550	0	10	3	8	700	11	32	19	28
NE San Jose, CA	2/9/17 & 2/11/17	24	458	6	6	1	3	686	10	31	20	29
Portland, OR	2/9/17 & 2/11/17	24	404	0	12	3	8	616	2	20	10	16
Average		24	514	3	14	7	**12**	649	7	29	17	**25**

As shown in Table 14, the highest recorded 95th percentile queue was 35 vehicles observed at the Tustin II Costco Gasoline site during the weekend midday peak period while the lowest 95th percentile queue was 16 vehicles and was observed at both the Portland and Rohnert Park Costco Gasoline sites. The average 95th percentile queue for all five sites is 25 vehicles.

Extrapolating the observed data to the 30-fueling position configuration proposed at Loomis and assuming each queued vehicle occupies 25 feet, each lane leading to a fueling position can store up to three vehicles (75 feet) without impacting the primary entry aisle from Sierra College Boulevard (not counting the vehicles at the fuel pump position). With ten fueling aisles each holding three vehicles, the queue storage area between the fuel pumps and primary entry aisle from Sierra College Boulevard can accommodate at least 30 vehicles before affecting operations at the drive aisle. The 30 available spaces would be in excess of the average 95th percentile queue observed at the five Costco Gasoline sites (25 vehicles). In addition, the five sites studied were limited to fewer fueling positions (24 vs. 30) which suggests queues at the proposed Project site should be shorter given the ability to fuel more vehicles simultaneously at the Project site.

Figure 15 illustrates the available queue storage area and the projected queues. As shown in the figure, the proposed Loomis Costco Gasoline fuel station site plan provides sufficient storage to accommodate the average 95th percentile queue anticipated without interference to the on-site drive aisle that leads to Sierra College Boulevard.

5.6 PROJECT VMT CALCULATION

Per the request of Caltrans District 3 staff, a general project-based Vehicle Miles Traveled (VMT) calculation was conducted for informational purposes and is documented in this section[10]. The request for VMT information stems from the State of California Senate Bill 743, which mandates a change in the way that public agencies evaluate transportation impacts of projects under the California Environment Quality Act.

The Governor's Office of Planning and Research has prepared the Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory) published November 2017 to provide an initial alternative approach to evaluating project effects on the transportation system. The Technical Advisory provides the following guidelines specific to retail projects:

- Lead agencies should usually analyze the effects of a retail project by assessing the change in total VMT, because a retail project typically re-routes travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.
- Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.
- Because new retail development typically redistributes shopping trips rather than creating new trips, estimating the total change in VMT (i.e. the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.
- By adding retail opportunities to the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Lead agencies generally, therefore, may presume such development creates a less than significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, might tend to have a significant impact. Where such development decreases VMT, lead agencies may consider it to have a less than significant impact.
- Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local serving. Generally, however, development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

[10] It should be noted that VMT evaluation is not an adopted methodology for determining significant impacts.

5.6.1 VMT Estimate Overview

At the time this report was prepared, no VMT evaluation methodology had been established by the lead agency (Town of Loomis) nor the City of Rocklin, Placer County or Caltrans. As such, a VMT assessment was prepared for informational purposes as described below considering the guidance enumerated by the Technical Advisory. The VMT estimate reflects factors including the anticipated site trip generation and distribution, Project membership, as well associated VMT changes at the existing Roseville Costco site. The VMT estimate development process included:

- assessment of Project trip generation
- assessment of Project trip length based on Costco member location
- assessment of anticipated growth in Costco membership at both the Project site and the existing Roseville Costco site
- estimation of Project site VMT associated with Costco members derived by adding the VMT associated with Project primary, diverted, and pass-by trips new to the surrounding roadway network
- estimating latent demand at the Roseville Costco site and adding that additional VMT to account for potential new trips to the Roseville Costco site
- combining the VMT for the Project site and the Roseville Costco site to develop a total new regional VMT
- adding VMT based on the regional trip length estimate to account for new Costco employees trips

In addition to the steps above, a trip length reduction associated with the opening of the Project site was estimated to document the potential VMT reduction that may be realized at the Roseville Costco site when some existing Roseville member trips re-route to the Project site. As will be described below, the total new VMT for the Project combined with new members to the Roseville site is estimated to be less than the overall regional VMT reduction realized at the existing Roseville site. Appendix “F” includes the analysis details.

5.6.2 Trip Generation and Trip Length

The total average daily trip generation for the Project is approximately 12,290 trips. As previously documented in Section 5.2, a significant number of these trips are pass-by and diverted trips (refer to Table 12). Pass-by trips are already on the roadway network and simply turn in and out of the Project site thereby not contributing additional mileage to the roadway network. Diverted trips are already on the roadway network and turn from a major route to access the site. For the purposes of this study, diverted trips were assumed to travel between the I-80 ramps and the Project site (approximately 0.5 mile). Trip generation for the Project site accounts for all trips to and from the site (members, employees, and deliveries).

A Costco Wholesale membership database-derived trip length for the Project site was estimated to be approximately 22 miles (average distance from member address to the Project site)[11]. The 22-miles estimate reflects only member trips.

Projected Costco Membership Growth

Due to the proximity of the Roseville Costco warehouse and proposed Project warehouse in Loomis, the market share projections provided by Costco Wholesale shows significant redistribution of existing members between the two sites. The Costco market projections estimate a total regional membership of 104,200 for both the Roseville and Loomis warehouses. Of these members 9,100 are projected to be new members (approximately 8.7 percent of the total membership). The remaining 95,100 members are existing members who are currently visiting the Roseville site and are already traveling on the regional transportation network.

5.6.3 VMT Projection

The following analysis is provided for informational purposes only, as the Town of Loomis has not yet adopted a VMT methodology or significance threshold.

Loomis Site VMT Projection

Projected VMT was estimated for the Loomis site using the Project trip generation estimates by trip type along with corresponding trip length as shown in Table 15.

Table 15: Estimated New Costco Daily VMT for Project Site

Trip	Average Trip Length (miles)	Project Daily Trips[1]	New Trips to Roadway Network (8.7%)	Estimated New CostcoVMT[2]
Costco Wholesale Membership Data	22.0	4,330	375	8,250 miles
Pass-by Trips	0.0	4,090	355	-
Diverted Trip Length[3]	0.5	3,870	335	170 miles
Estimated VMT				**8,420 miles**

Notes:
[1]Based on the average Costco trip characteristics in Table 12
[2] Estimated VMT reflects average trip length × Project daily trips
[3] Reflects assumed diverted trip length from I-80 to the Project site
Source: Kittelson & Associates, Inc. 2019

[11] Costco Wholesale provided the zip code location of existing and potential new members that would likely use the proposed warehouse in Loomis. A ratio was developed for each zip code to the total members being served by the proposed Costco Warehouse. With the general location of members by zip code known, a trip length of was estimated from the proposed Project site to the centroid of each zip code polygon using a GIS tool. The weighted average of all trip lengths shows the average trip length from the Project site for members is approximately 22 miles.

As shown, the projected VMT increase attributable to the Project site is 8,420 miles. This estimate does not reflect a potential reduction in VMT associated with re-routing of Costco member trips that currently are made to the Roseville site but that may transfer to the Project site out of convenience/shorter travel distance.

Roseville Site VMT Projection

Latent demand is expected to be realized at the Roseville warehouse as it becomes less crowded with the new Loomis Project opening and new Costco members shop the existing warehouse. To account for new members at the existing Roseville warehouse, VMT was also estimated for potential new trips to the Roseville site. Similar to the format of Table 15, Table 16 summarizes the projected new VMT for the Roseville site. The daily trip estimates shown were developed using the Costco average trip rates in Table 11. Trip lengths were based on the Costco Wholesale membership data assuming development of Project.

Table 16: Estimated New Costco Daily VMT for Roseville Site

Trip	Average Trip Length (miles)	Daily Trips[1]	New Trips to Roadway Network (8.7%)	Membership Estimated VMT[2]
Costco Wholesale Membership Data[3]	7.2	3,815	330	2,375 miles
Pass-by Trips	0.0	3,620	315	0 miles
Diverted Trip Length[4]	0.5	3,425	300	150 miles
Estimated VMT				**2,525 miles**

Notes:
[1] Based on the average Costco trip characteristics in Table 11 (same database as Project site) and a warehouse size of 136,954 square feet.
[2] Estimated VMT reflects average trip length × daily trips
[3] Trip lengths based on projected Costco market share for Roseville site assuming development of Project site (Project site development results in some longer distance trips currently shopping at Roseville shifting to the Project site in Loomis, resulting in a reduced average trip length compared to existing)
[4] Reflects assumed diverted trip length from SR-65 to the Roseville warehouse site
Source: Kittelson & Associates, Inc. 2019

Total Costco VMT Increase

Combining the VMT estimates in Tables 15 and 16 yields a total new daily regional VMT of approximately 10,945 miles (8,420 miles for Project site + 2,525 miles for Roseville site).

Recognizing the Costco membership database methodology described above does not account for trips made by Costco employees, additional VMT was calculated reflecting an average of 250 employees on-site per day and using the City of Rocklin Travel Demand Model trip length for commercial land uses[12]. The VMT generated by employees is estimated to be 3,900 miles (500 trips x 7.8 miles).

[12] The City of Rocklin 2030 Travel Demand Model was used to generate a select zone analysis for the traffic analysis zone (TAZ) that contains the Project. The resultant select zone analysis provides an estimated average one-way trip length for the Project of 7.8 miles.

In addition, Costco would have delivery trucks for the warehouse and fuel facility. Costco estimates 13 warehouse deliveries a day, most likely from their facility located in Tracy, California which is approximately 100 miles from the Project site. Therefore, the average daily VMT for warehouse deliveries would be 26 trips (13 trucks inbound and outbound) multiplied by 100 miles which is approximately 2,600 VMT. The 7 fuel delivery trucks per day are expected to travel between the Project site and the West Sacramento terminal location (identified by the Air Quality study). The West Sacramento terminal is located approximately 30 miles from the Project site and is located with the SACOG region. Therefore, the average daily VMT for fuel deliveries would be 14 trips (7 trucks inbound and outbound) multiplied by 30 miles which is approximately 420 VMT within the region. Total VMT for truck trips to the Project site is approximately 3,020 miles (2,600 miles by warehouse deliveries + 420 miles by fuel deliveries).

Therefore, the membership database methodology yields total new daily VMT of 17,865 miles (10,945 miles + 3,900 miles + 3,020 miles).

Potential Regional VMT Reduction

The proposed Costco warehouse would be located approximately 5 miles north of the existing Roseville Costco warehouse. Based on Costco membership data, an estimated 31 percent of existing Roseville Costco members are located north of the Project site. These members to the north could realize a trip length reduction of approximately 5 miles by switching membership from the Roseville site to the Project site, benefiting the transportation system with a VMT reduction.

Final VMT

In summary, total new daily VMT for the Project and new members to the Roseville site is estimated to be 17,865 miles. A VMT reduction could be realized as a function of the shorter trip length experienced by the 31 percent of existing Roseville Costco members who shorten their shopping trip length by changing membership to and shopping at the Project site.

Section 6
Existing plus Project Conditions

6.0 EXISTING PLUS PROJECT CONDITIONS

The Existing plus Project traffic conditions analysis forecasts how the study area's transportation system would operate with the addition of traffic generated by the proposed Project. The proposed roadway infrastructure improvements as outlined in Section 5.1.2 would be constructed in this condition.

6.1 INTERSECTION EVALUATION

Existing conditions traffic volumes for the weekday AM and PM and weekend midday peak hours were added to the site-generated traffic to arrive at the total traffic volumes. Figure 16 shows the Existing Plus Project (Project Driveway Option 1A) traffic condition during weekday AM and PM peak hours and Figure 17 shows the Existing Plus Project (Project Driveway Option 1A) traffic condition during weekend midday peak hour.

The site-generated trip assignment with Project Driveway Options 1B and 1C results in different existing plus Project peak hour traffic volumes at study intersections 7, 8, 21, 24, 25, and 37 due to the routing of site trips to the driveways. All other study intersections would have the same Existing Plus Project traffic volumes under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Figure 18 shows the Existing plus Project traffic condition during weekday AM and PM peak hours for all three Project driveway options at those study intersections affected by the driveway options. Similarly, Figure 19 shows the Existing Plus Project traffic condition during weekend midday peak hour for all three Project driveway options at those study intersections affected by the driveway options.

6.1.1 Level-of-Service Analysis

To gauge the impact of the Project traffic on the existing roadway network, the Project analysis assumed that signal timings would be unchanged from those in existing baseline conditions except at study locations where the Project provides geometric improvements.

Project Driveway Option 1A

Table 17 shows the baseline Existing No-Project and Plus Project (Project Driveway Option 1A) delays for and LOS for the study intersections during weekday AM and PM peak hours. Table 18 shows the baseline Existing No-Project and Plus Project (Project Driveway Option 1A) delays and LOS for the study intersections during the weekend midday peak hour.

As shown in Table 17 and Table 18, the following intersections operate at unacceptable LOS:

- Horseshoe Bar Road & I-80 Eastbound Ramp (AM and PM)
- Sierra College Boulevard & Taylor Road (PM)
- Sierra College Boulevard & Rocklin Road (AM and PM)
- Pacific Street & Dominguez Road/Delmar Avenue (PM)

- Pacific Street & Rocklin Road (AM)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- El Don Drive & Rocklin Road (AM)
- Sierra College Boulevard & SR-193 (PM)
- Sierra College Boulevard & Delmar Avenue (AM, PM, and MD)
- Taylor Road & Penryn Road (South) (AM)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)
- Taylor Road & Webb Street (PM and MD)

Based on the impact criteria defined earlier, the following intersections would be significantly impacted by the proposed Project (Project Driveway Option 1A):

- Sierra College Boulevard & SR-193 (PM)
- Taylor Road & Penryn Road (South) (AM)
- Taylor Road & Webb Street (MD)

Appendix “B” includes the level-of-service worksheets.

Table 17: Existing Plus Project - Intersection LOS Analysis, Weekday AM/PM Peak Hour – Project Driveway Option 1A

ID	Intersection	Traffic Control Type	Weekday AM					Weekday PM				
			Existing		Plus Project		Change in Delay (sec)	Existing		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS		Delay (sec)	LOS	Delay (sec)	LOS	
1	Taylor Rd/ King Rd	Signal	33.3	C	33.8	C	0.5	37.7	D	39.4	D	1.7
2	Taylor Rd/ Horseshoe Bar Rd	Signal	30.3	C	31.2	C	0.9	26.3	C	27.2	C	0.9
3	Horseshoe Bar Rd/ I-80 Westbound Ramp	Signal	13.8	B	13.8	B	0.0	14.0	B	14.0	B	0.0
4	Horseshoe Bar Rd/ I-80 Eastbound[1] Ramp	TWSC	**70.2**	**F**	**70.2**	**F**	0.0	**68.2**	**F**	**68.2**	**F**	0.0
5	Barton Rd/ Brace Rd	TWSC	10.8	B	10.9	B	0.1	10.7	B	10.9	B	0.2
6	Sierra College Blvd/Taylor Rd	Signal	31.8	C	32.8	C	1.0	**38.3**	**D**	**41.6**	**D**	3.3
7	Sierra College Blvd/Brace Rd	Signal	9.7	A	13.2	B	3.5	10.7	B	14.1	B	3.4
8	Sierra College Blvd/Granite Dr	Signal	24.4	C	24.8	C	0.4	27.1	C	28.3	C	1.2
9	Sierra College Blvd/I-80 WB	Signal	13.2	B	13.7	B	0.5	19.0	B	27.1	C	8.1
10	Sierra College Blvd/I-80 EB	Signal	14.6	B	14.7	B	0.1	16.1	B	16.3	B	0.2
11	Sierra College Blvd/Schriber Way	TWSC	9.2	A	9.2	A	0.0	9.2	A	9.2	A	0.0
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	6.5	A	6.5	A	0.0	7.5	A	7.5	A	0.0
13	Sierra College Blvd/Stadium Dwy	Signal	6.1	A	6.1	A	0.0	6.6	A	6.6	A	0.0
14	Sierra College Blvd/Rocklin Rd	Signal	**35.7**	**D**	**35.8**	**D**	0.1	**43.3**	**D**	**45.0**	**D**	1.7
15	Pacific St/ Dominguez Rd-Delmar Ave	Signal	15.4	B	15.7	B	0.3	**43.7**	**D**	**44.2**	**D**	0.5
16	Pacific St/ Rocklin Rd	Signal	**39.9**	**D**	**40.0**	**D**	0.1	33.7	C	34.2	C	0.5
17	Granite Dr/ Rocklin Rd	Signal	**40.7**	**D**	**40.9**	**D**	0.2	**50.8**	**D**	**52.1**	**D**	1.3
18	I-80 Westbound Ramps/ Rocklin Rd	Signal	20.4	C	20.4	C	0.0	38.8	D	38.8	D	0.0
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	31.0	C	31.0	C	0.0	30.3	C	30.3	C	0.0
20	Aguilar Rd/ Rocklin Rd	Signal	10.4	B	10.5	B	0.1	8.1	A	8.2	A	0.1
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.3	A	0.3	A	0.0	12.6	B	12.9	B	0.3

ID	Intersection	Traffic Control Type	Weekday AM					Weekday PM				
			Existing		Plus Project		Change in Delay (sec)	Existing		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS		Delay (sec)	LOS	Delay (sec)	LOS	
22	Granite Dr/ Dominguez Rd	TWSC	11.7	B	11.8	B	0.1	12.8	B	13.0	B	0.2
23	El Don Dr/ Rocklin Rd	Signal	**35.8**	**D**	**35.8**	**D**	0.0	34.9	C	35.0	C	0.1
24	Sierra College Blvd/Project Driveway	Signal	DNE		6.5	A	-	DNE		11.3	B	-
25	Brace Road/ Project Driveway	TWSC	DNE		0.0	A	-	DNE		9.5	A	-
26	Sierra College Blvd/SR-193	AWSC	22.5	C	23.0	C	0.5	**43.1**	**E**	**45.8**	**E**	2.7
27	Sierra College Blvd/English Colony Way	TWSC	11.0	B	11.4	B	0.4	19.8	C	21.6	C	1.8
28	Sierra College Blvd/Delmar Av[2]	TWSC	**38.0**	**E**	**39.5**	**E**	1.5	**41.4**	**E**	**45.5**	**E**	4.1
29	Taylor Rd/English Colony Way	AWSC	21.4	C	21.5	C	0.1	13.2	B	13.4	B	0.2
30	Taylor Rd/Penryn Road (North)	TWSC	14.4	B	14.4	B	0.0	10.0	B	10.1	B	0.1
31	Taylor Rd/Penryn Road (South)	TWSC	**233.5**	**F**	**245.3**	**F**	11.8	15.5	C	16.1	C	0.6
32	Taylor Rd/Del Oro High School North[1] Lot	TWSC	**31.9**	**D**	**32.7**	**D**	0.8	12.0	B	12.2	B	0.2
33	Taylor Rd/Del Oro High School Drop-Off[1]	TWSC	**265.0**	**F**	**273.4**	**F**	8.4	14.1	B	14.3	B	0.2
34	Taylor Rd/Del Oro High School South[1] Lot	TWSC	**40.9**	**E**	**41.6**	**E**	0.7	15.7	C	15.9	C	0.2
35	Taylor Rd/ Rippey Road	TWSC	13.9	B	13.9	B	0.0	11.3	B	11.3	B	0.0
36	Taylor Rd/ Webb Street[1]	TWSC	21.4	C	21.8	C	0.4	**26.8**	**D**	**28.7**	**D**	1.9
37	Brace Road/ Project Driveway East	TWSC	DNE		10.0	B	-	DNE		9.3	A	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates Project impact
[1] An impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection. At these locations, the project does not contribute 5% or more of the volumes.
[2] Intersection does not meet signal warrants for impacts condition, therefore per the Placer County guidelines, this intersection is not significantly impacted. Traffic signal warrants provided in Appendix J.

Source: Kittelson & Associates, Inc. 2019

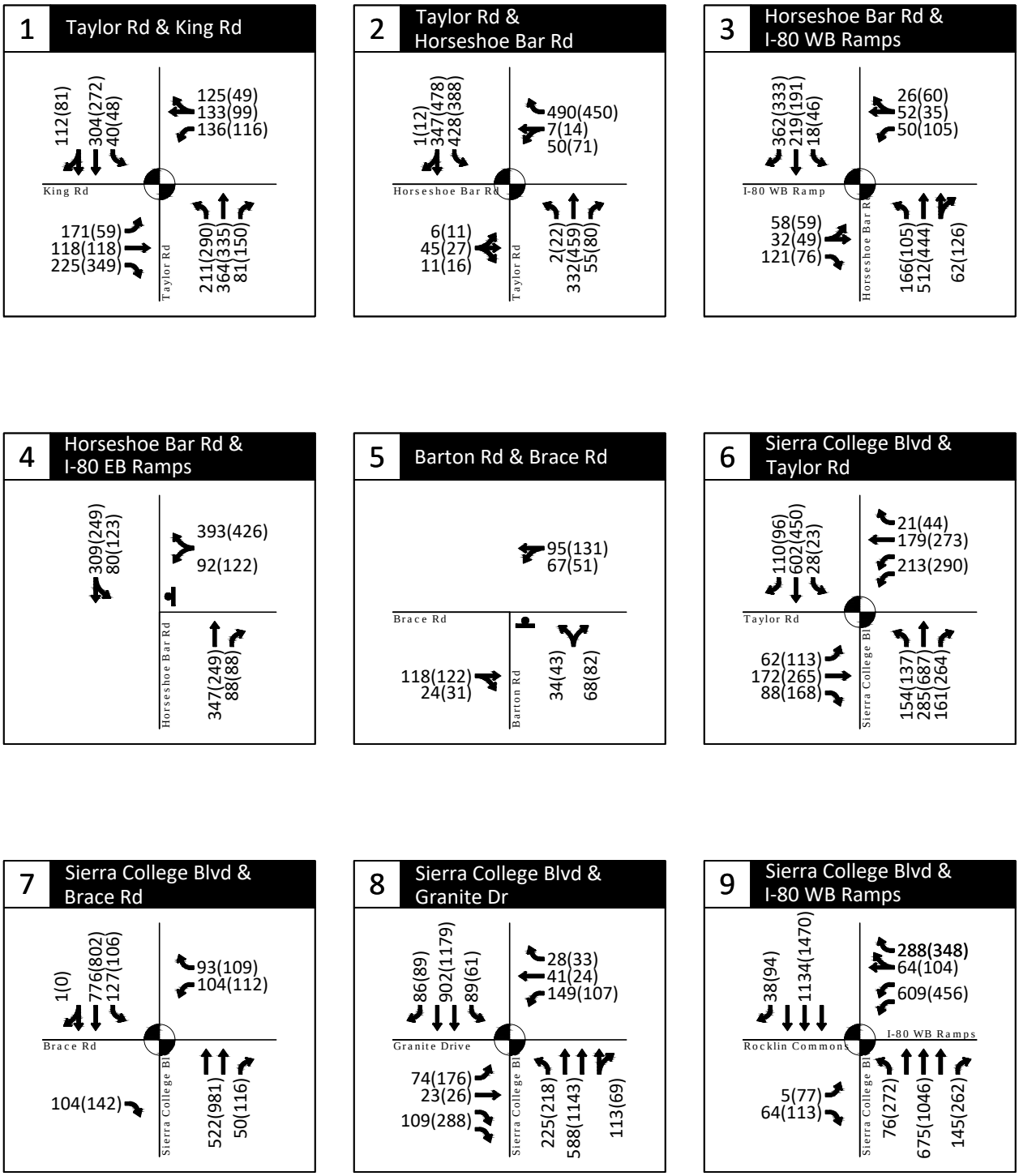
Table 18: Existing Plus Project - Intersection LOS Analysis, Weekend Midday Peak Hour – Project Driveway Option 1A

ID	Intersection	Traffic Control Type	Existing		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
1	Taylor Rd/King Rd	Signal	21.8	C	23.1	C	1.3
2	Taylor Rd/Horseshoe Bar Rd	Signal	13.9	B	14.9	B	1.0
3	Horseshoe Bar Rd/I-80 Westbound Ramp	Signal	13.4	B	13.4	B	0.0
4	Horseshoe Bar Rd/I-80 Eastbound Ramp	TWSC	28.7	D	28.7	D	0.0
5	Barton Rd/Brace Rd	TWSC	12.2	B	12.6	B	0.4
6	Sierra College Blvd/Taylor Rd	Signal	25.0	C	28.1	C	3.1
7	Sierra College Blvd/Brace Rd	Signal	9.1	A	15.0	B	5.9
8	Sierra College Blvd/Granite Dr	Signal	22.6	C	23.7	C	1.1
9	Sierra College Blvd/I-80 WB Ramps	Signal	19.3	B	30.3	C	11.0
10	Sierra College Blvd/I-80 EB Ramps	Signal	16.5	B	16.6	B	0.1
11	Sierra College Blvd/Schriber Way	TWSC	10.3	B	9.9	A	-0.4
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	8.7	A	8.5	A	-0.2
13	Sierra College Blvd/Stadium Dwy	Signal	4.4	A	4.3	A	-0.1
14	Sierra College Blvd/Rocklin Rd	Signal	24.9	C	25.9	C	1.0
15	Pacific St/Dominguez Rd-Delmar Ave	Signal	12.7	B	13.5	B	0.8
16	Pacific St/Rocklin Rd	Signal	19.6	B	20.3	C	0.7
17	Granite Dr/Rocklin Rd	Signal	43.7	D	**45.6**	**D**	1.9
18	I-80 Westbound Ramps/Rocklin Rd	Signal	20.6	C	20.6	C	0.0
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	24.6	C	24.6	C	0.0
20	Aguilar Rd/Rocklin Rd	Signal	8.0	A	8.2	A	0.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
22	Granite Dr/Dominguez Rd	TWSC	12.5	B	12.9	B	0.4
23	El Don Dr/Rocklin Rd	Signal	13.7	B	14.1	B	0.4
24	Sierra College Boulevard/Project Driveway	Signal	DNE		14.5	B	-
25	Brace Road/Project Driveway	TWSC	DNE		9.2	A	-
26	Sierra College Blvd/SR-193	AWSC	19.7	C	21.5	C	1.8
27	Sierra College Blvd/English Colony Way	TWSC	12.2	B	13.2	B	1.0
28	Sierra College Blvd/Delmar Avenue[2]	TWSC	22.2	C	**25.4**	**D**	3.2
29	Taylor Rd/English Colony Way	AWSC	15.4	C	16.1	C	0.7
30	Taylor Rd/Penryn Road (North)	TWSC	10.2	B	10.3	B	0.1
31	Taylor Rd/Penryn Road (South)	TWSC	12.0	B	12.5	B	0.5

ID	Intersection	Traffic Control Type	Existing		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
32	Taylor Rd/Del Oro High School North Lot	TWSC	13.5	B	14.1	B	0.6
33	Taylor Rd/Del Oro High School Drop-Off	TWSC	19.4	C	21.0	C	1.6
34	Taylor Rd/Del Oro High School South Lot	TWSC	16.1	C	16.7	C	0.6
35	Taylor Rd/Rippey Road	TWSC	11.6	B	11.9	B	0.3
36	Taylor Rd/Webb Street	TWSC	**70.2**	**F**	**121.4**	**F**	51.2
37	Brace Road/Project Driveway East	TWSC	DNE		9.3	A	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates Project impact
[1] An impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection. At these locations, the project does not contribute 5% or more of the volumes.
[2] Intersection does not meet signal warrants for impacts condition, therefore per the Placer County guidelines, this intersection is not significantly impacted. Traffic signal warrants provided in Appendix J.

Source: Kittelson & Associates, Inc. 2019



AM(PM) - Weekday Traffic Volume

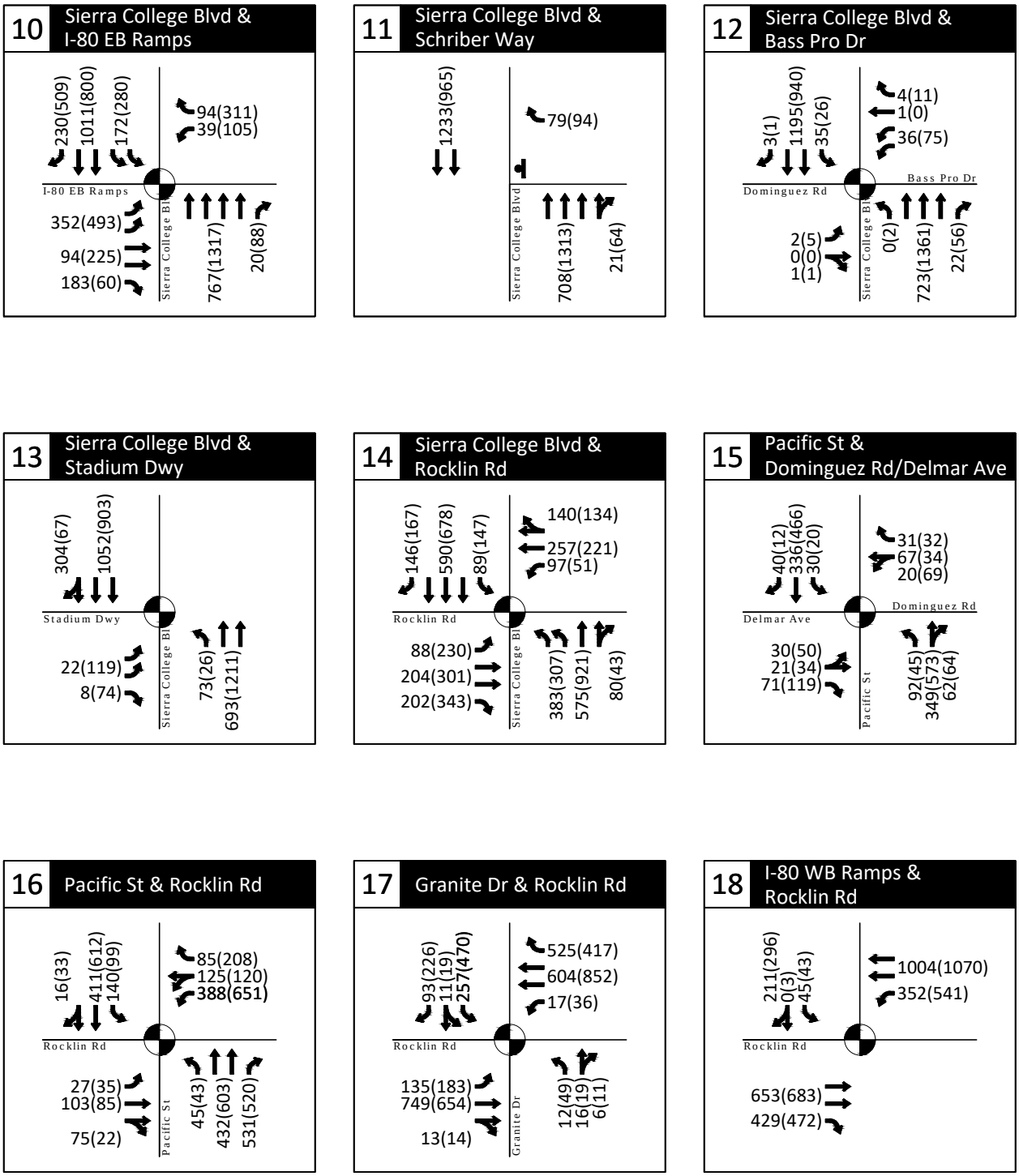
- Stop Sign

- Traffic Signal

Existing Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
16A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:11pm - aloveday Layout Tab: ExP AM_PM A



AM(PM) - Weekday Traffic Volume

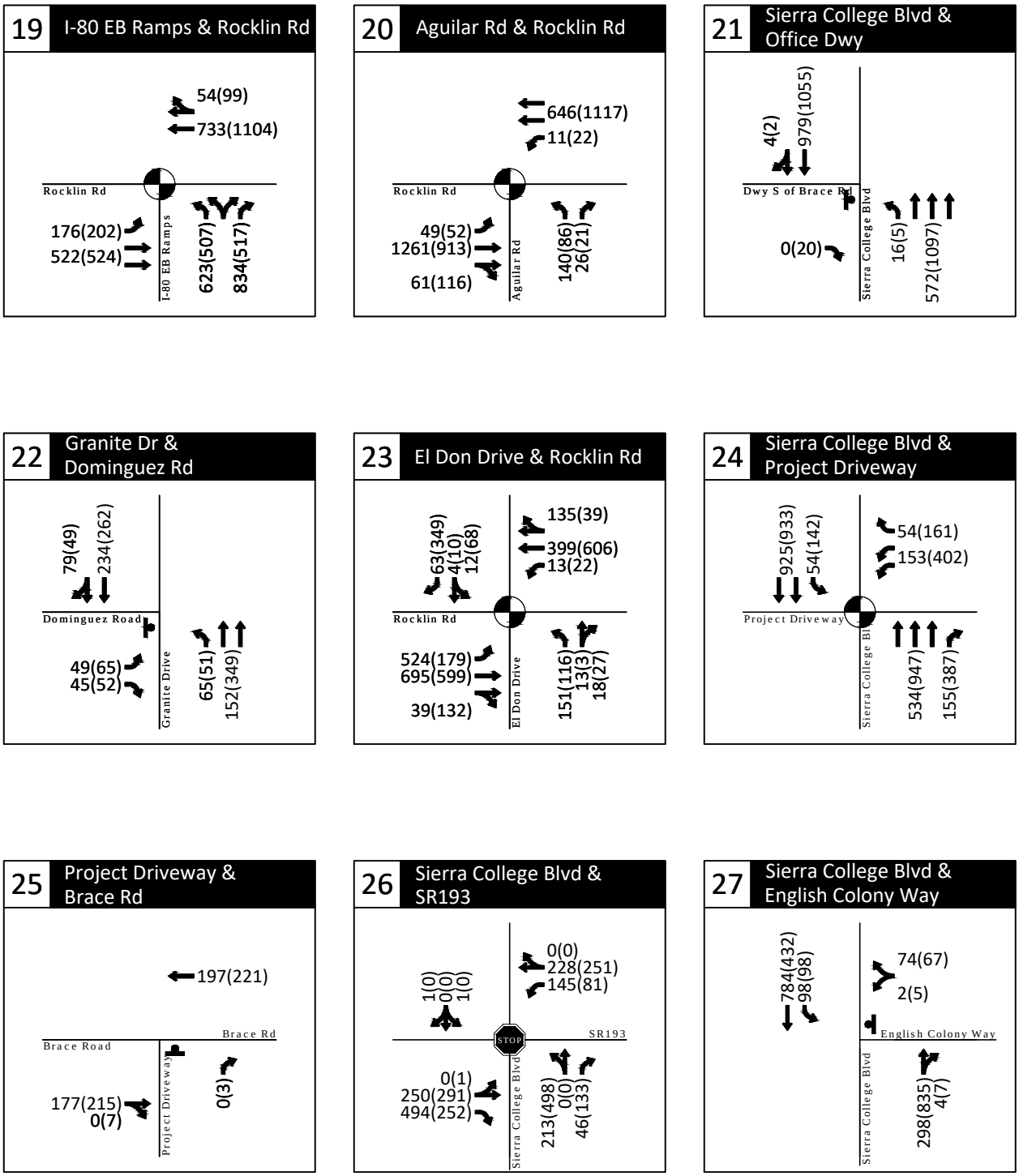
- Stop Sign

- Traffic Signal

Existing Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
16B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:11pm - aloveday Layout Tab: ExP AM_PM B



AM(PM) - Weekday Traffic Volume

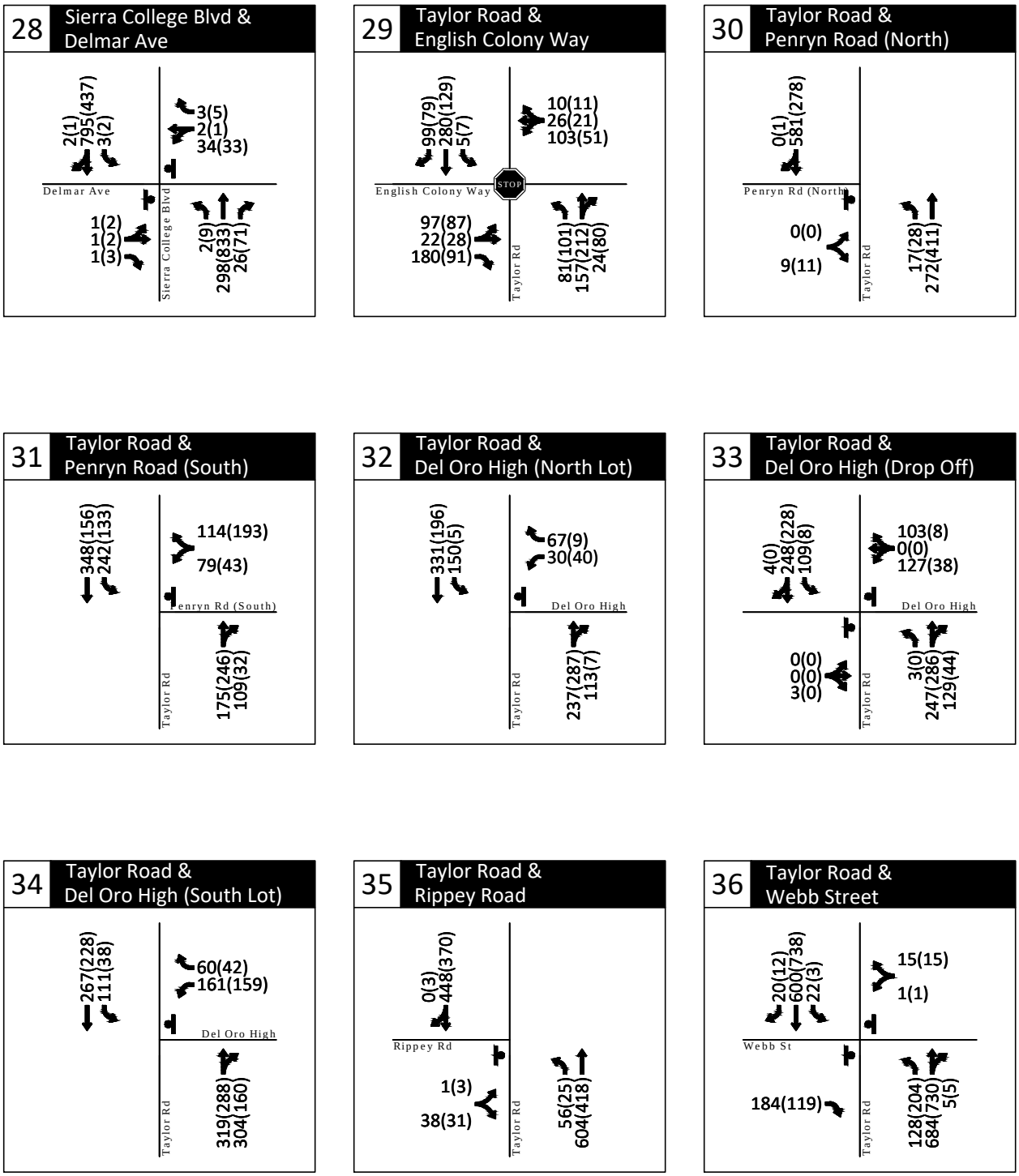
- Stop Sign

- Traffic Signal

Existing Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
16C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:12pm - aloveday Layout Tab: ExP AM_PM C



AM(PM) - Weekday Traffic Volume

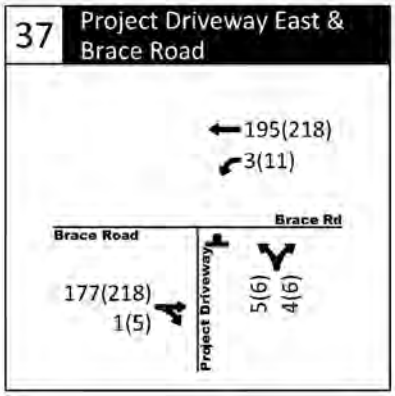
- Stop Sign

- Traffic Signal

Existing Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure 16D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:12pm - aloveday Layout Tab: ExP AM_PM D



AM(PM) - Weekday Traffic Volume

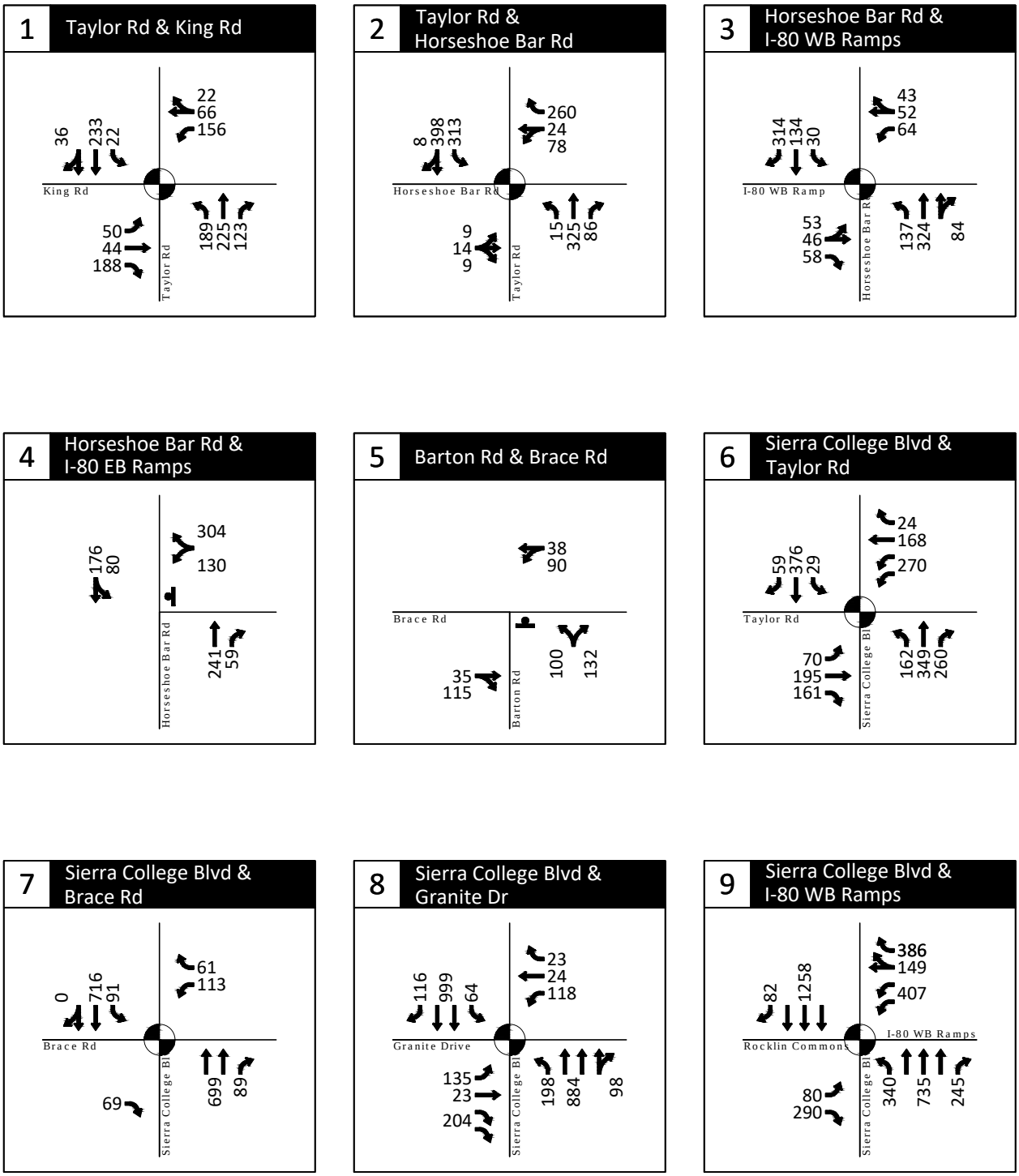
- Stop Sign

- Traffic Signal

Existing Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
16E

H:\2012345 - Confidential Loomis Costco\Dwgs\Figs\20345_Fig2_20190703 - Option A.dwg Oct 22, 2019 - 4:32pm - alloveday Layout Tab: ExP AM_PM E



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

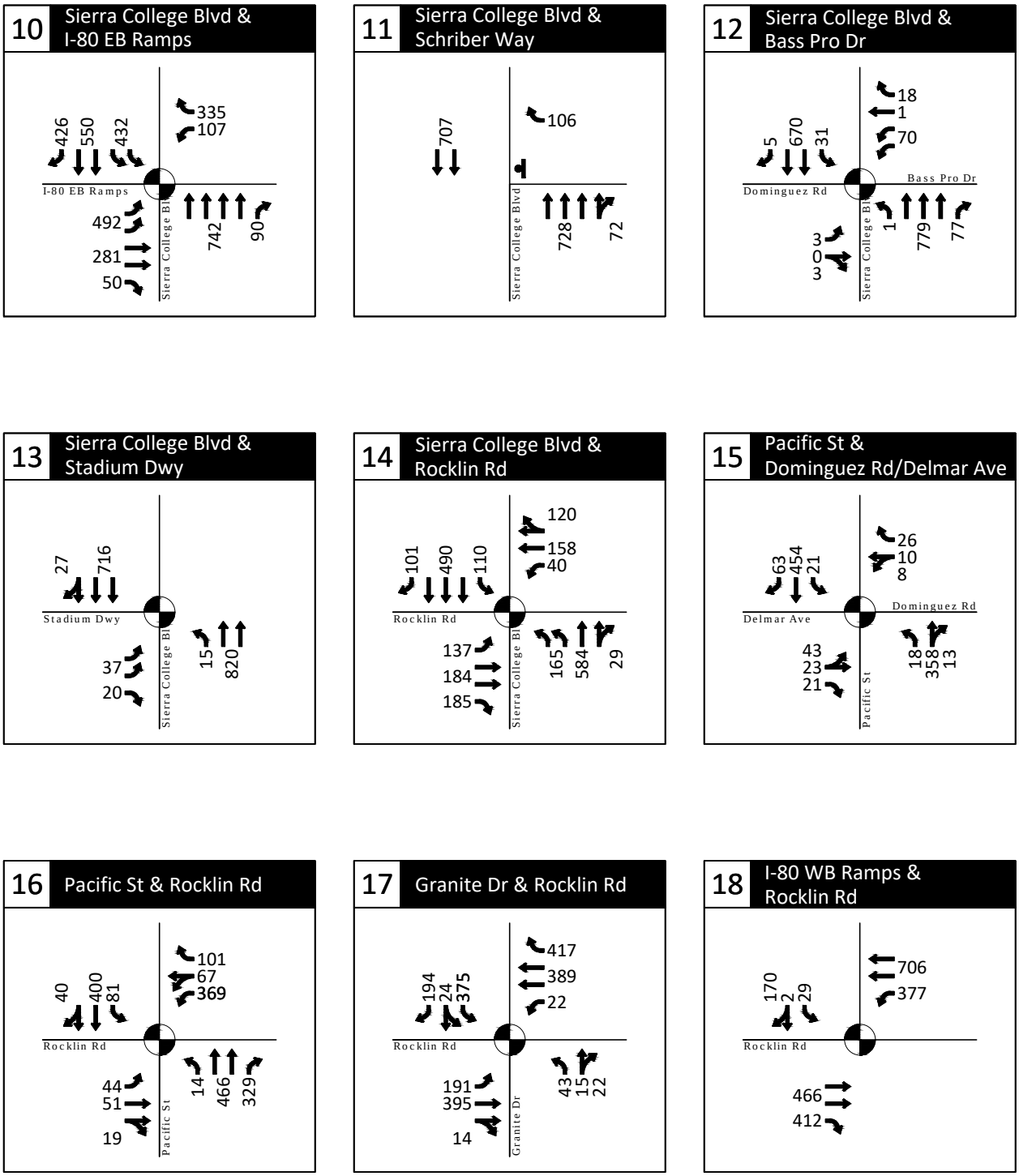
Existing Plus Project Traffic Conditions

Weekend Midday Peak Hour - Project Driveway Option 1A

Loomis, California

Figure 17A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:13pm - aloveday Layout Tab: EXP SAT A

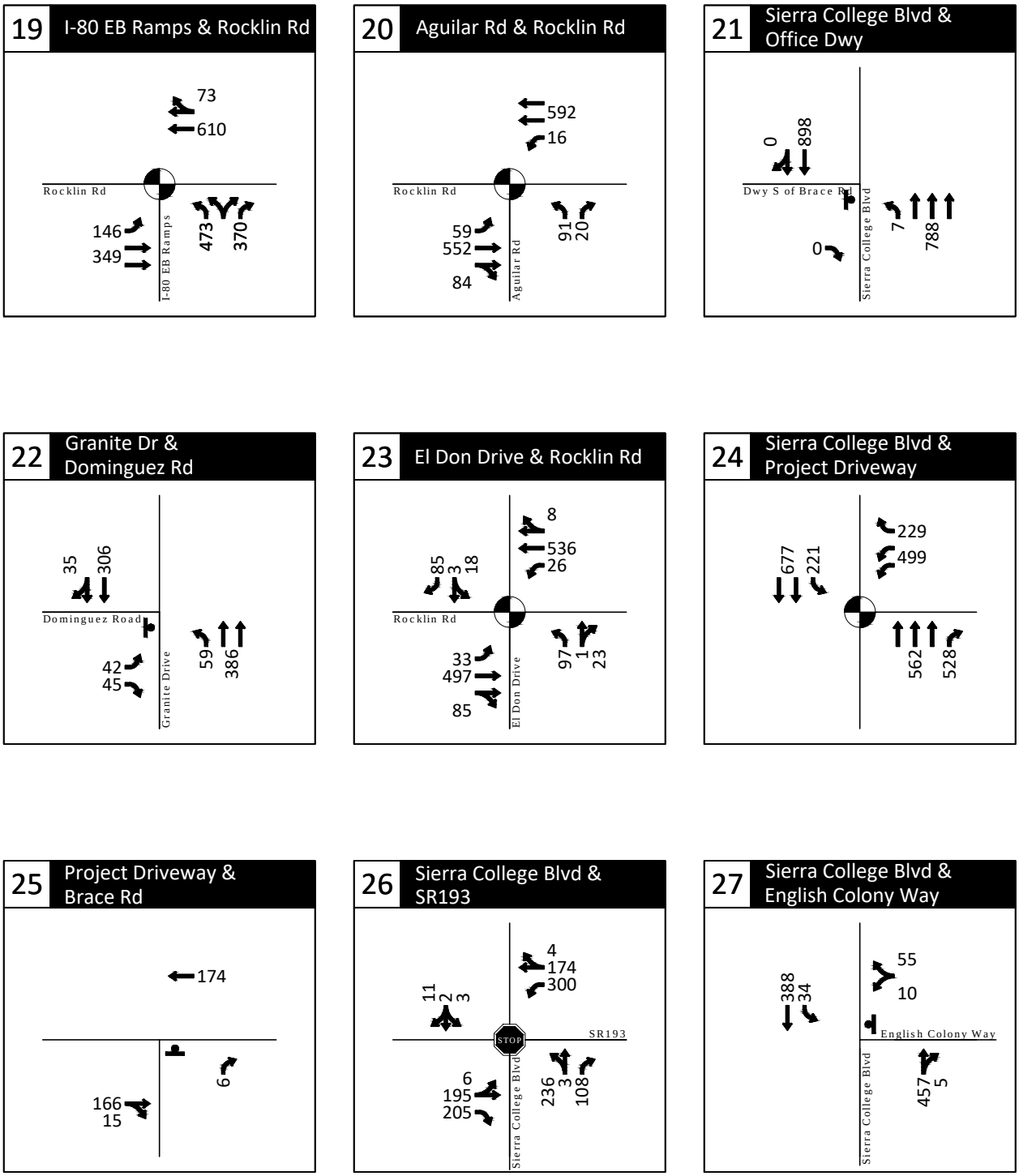


- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Existing Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
17B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:14pm - aloveday Layout Tab: EXP SAT B



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

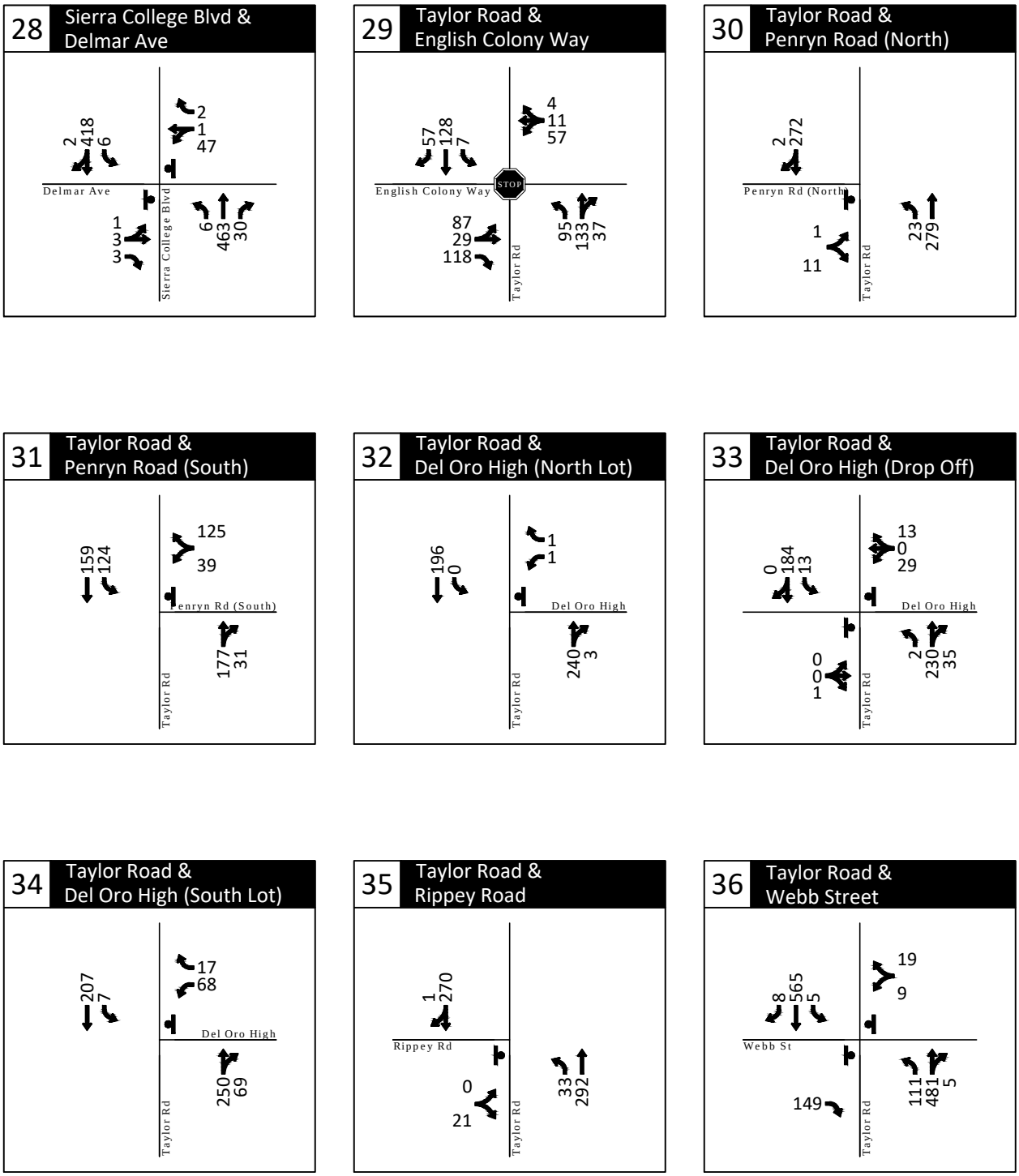
Existing Plus Project Traffic Conditions

Weekend Midday Peak Hour - Project Driveway Option 1A

Loomis, California

Figure 17C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:14pm - aloveday Layout Tab: EXP SAT C

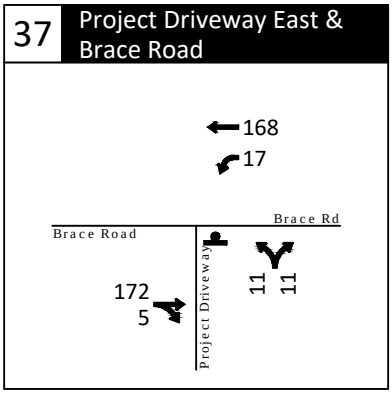


- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Existing Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
17D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:14pm - aloveday Layout Tab: EXP SAT D



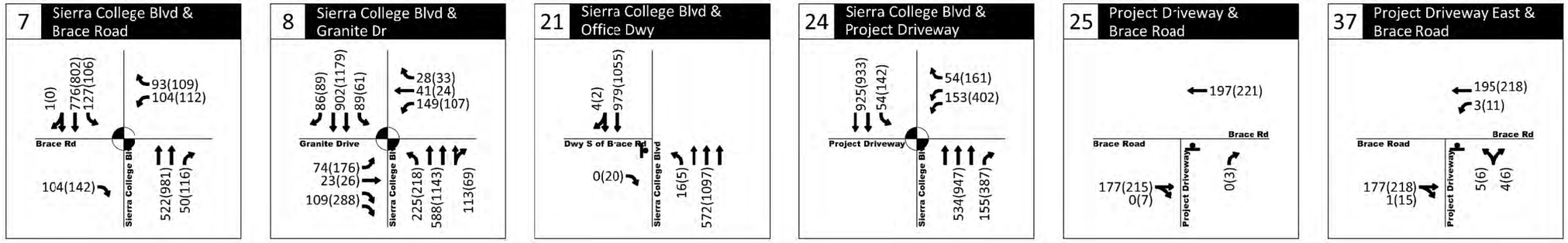
- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Existing Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

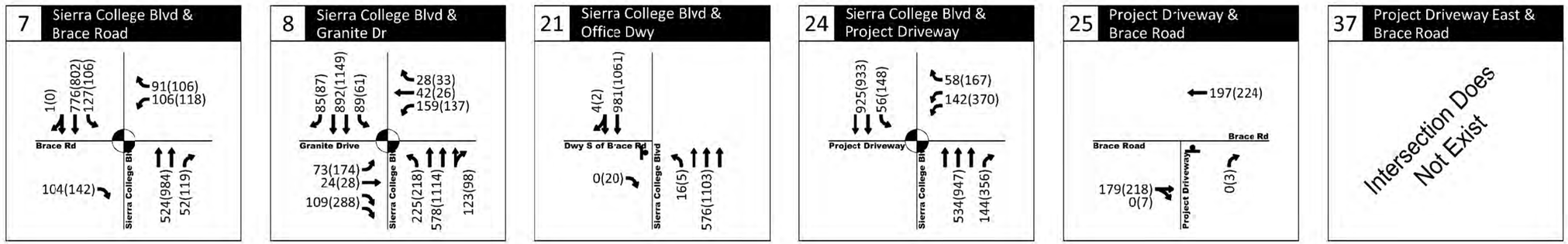
Figure
17E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:54pm - aloveday Layout Tab: EXP SAT E

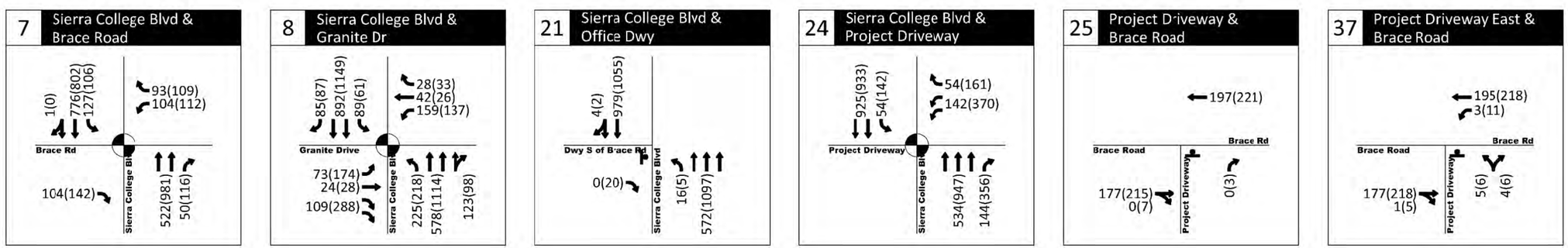
OPTION 1A



OPTION 1B



OPTION 1C



AM(PM) - Weekday Traffic Volume

- Stop Sign

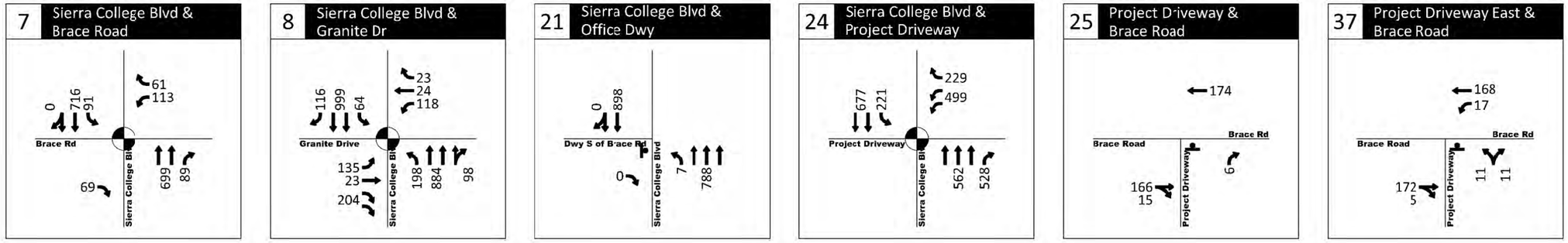
- Traffic Signal

Existing Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Options 1B & 1C
Loomis, California

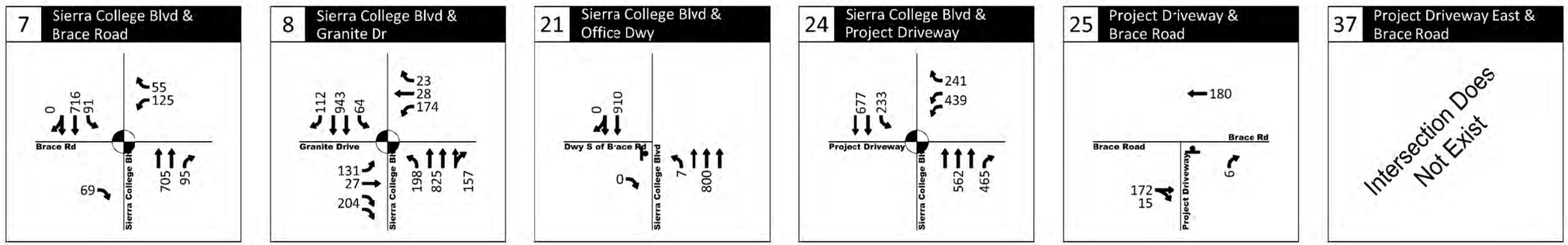
Figure 18

H:\2020345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 31, 2019 - 10:49am - alovesay Layout Tab: ExP-AM_PM

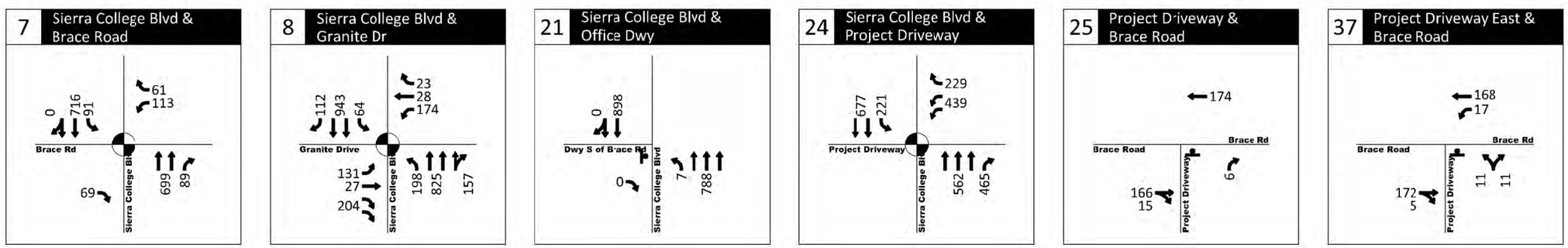
OPTION 1A



OPTION 1B



OPTION 1C



- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Existing Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Options 1B & 1C
Loomis, California

Figure 19

KITTELSON & ASSOCIATES

H:\2020345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 31, 2019 - 10:51am - aloveday Layout Tab: ExP-SAT

Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C would affect operations of study intersections 7, 8, 21, 24, 25, and 37 due to the previously cited Project driveway trip routing. All other study intersections would operate the same under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Table 19 shows the baseline Existing No-Project and Plus Project delays and LOS at those study intersections affected by the options during weekday AM and PM peak hours. Table 20shows the baseline Existing No-Project and Plus Project delays and LOS at those study intersections affected by the options during the weekend midday peak hour.

As shown in the two tables, none of the six study intersections affected by site trip routing to the Project driveways are significantly impacted by the proposed Project for Project Driveway Options 1B and 1C.

Table 19: Existing Plus Project - Intersection LOS Analysis, Weekday AM/PM Peak Hour – Project Driveway Options 1B & 1C

ID	Intersection	Traffic Control Type	Weekday AM					Weekday PM				
			Existing		Plus Project		Change in Delay (sec)	Existing		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS		Delay (sec)	LOS	Delay (sec)	LOS	
Driveway Option 1B												
7	Sierra College Blvd/Brace Rd	Signal	9.7	A	13.2	B	3.5	10.7	B	16.7	B	6.0
8	Sierra College Blvd/Granite Dr	Signal	24.4	C	24.1	C	-0.3	27.1	C	29.9	C	2.8
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.3	A	0.3	A	0.0	12.6	B	13.0	B	0.4
24	Sierra College Blvd/Project Driveway	Signal	DNE		6.5	A	-	DNE		11.2	B	-
25	Brace Road/Project Driveway	TWSC	DNE		0.0	A	-	DNE		9.5	A	-
37	Brace Road/Project Driveway East	TWSC	DNE					DNE				
Driveway Option 1C												
7	Sierra College Blvd/Brace Rd	Signal	9.7	A	13.2	B	3.5	10.7	B	14.1	B	3.4
8	Sierra College Blvd/Granite Dr	Signal	24.4	C	24.1	C	-0.3	27.1	C	29.9	C	2.8
21	Sierra College Blvd/Dwy South of	TWSC	0.3	A	0.3	A	0.0	12.6	B	12.9	B	0.3
24	Sierra College Blvd/Project Driveway	Signal	DNE		6.4	A	-	DNE		11.0	B	-
25	Brace Road/Project Driveway	TWSC	DNE		0.0	A	-	DNE		9.5	A	-
37	Brace Road/ Project Driveway East	TWSC	DNE		10.0	B	-	DNE		10.4	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Source: Kittelson & Associates, Inc. 2019

Table 20: Existing Plus Project - Intersection LOS Analysis, Weekend Midday Peak Hour – Project Driveway Options 1B & 1C

ID	Intersection	Traffic Control Type	Existing		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
Driveway Option 1B							
7	Sierra College Blvd/Brace Rd	Signal	9.1	A	12.6	B	3.5
8	Sierra College Blvd/Granite Dr	Signal	22.6	C	24.8	C	2.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	DNE		0.1	A	-
24	Sierra College Boulevard/Project Driveway	Signal	DNE		15.6	B	-
25	Brace Road/Project Driveway	TWSC	DNE		9.3	A	-
37	Brace Road/Project Driveway East	TWSC	DNE				
Driveway Option 1C							
7	Sierra College Blvd/Brace Rd	Signal	9.1	A	15.0	B	5.9
8	Sierra College Blvd/Granite Dr	Signal	22.6	C	24.8	C	2.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	DNE		0.1	A	-
24	Sierra College Boulevard/Project Driveway	Signal	DNE		14.1	B	-
25	Brace Road/Project Driveway	TWSC	DNE		9.2	A	-
37	Brace Road/Project Driveway East	TWSC	DNE		10.1	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Source: Kittelson & Associates, Inc. 2019

6.1.2 Queuing Analysis

The 95th percentile queues at the study intersections were reviewed to identify locations where the queues may exceed the available storage capacity. Appendix C provides the summary table for the weekday AM, PM and weekend midday peak hours. Appendix "G" includes the Project contribution tables.

Project Driveway Option 1A

One or more 95th percentile queues would extend beyond the available storage lengths at the following intersections for Project Driveway Option 1A:

- Taylor Road & King Road (AM, PM, and MD)
- Taylor Road & Horseshoe Bar Road (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Westbound Ramp (AM, PM, and MD)
- Sierra College Boulevard & Taylor Road (PM)
- Sierra College Boulevard & Granite Drive (AM and PM)
- Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- Sierra College Boulevard & Rocklin Road (AM and PM)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (PM)
- I-80 Eastbound Ramps & Rocklin Road (AM and PM)
- El Don Drive & Rocklin Road (AM and PM)
- Taylor Road & English Colony Way (AM and MD)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (PM and MD)
- The westbound through at I-80 Eastbound Ramps & Rocklin Road would affect operations at Aguilar Road & Rocklin Road (PM)

Based on the intersection queuing significant impact criteria presented in Section 2 (Project traffic causes queue overflow or if queues overflows under no Project, the Project contributes 5% of the total traffic for the movement), an intersection queue significant impact occurs at the following intersections under Project Driveway Option 1A:

- Taylor Road & King Road (MD)
- Sierra College Boulevard & Granite Drive (PM)
- Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- Granite Drive & Rocklin Road (MD)

Project Driveway Options 1B & 1C

As previously explained, Project Driveway Options 1B and 1C would affect operations of study intersections 7, 8, 21, 24, 25, and 37 due to driveway trip routing. All other study intersections would operate the same under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Of the six affected intersections, one or more 95th percentile queues would extend beyond the available storage lengths at the following intersections (for those intersections affected by the driveway options):

- Sierra College Boulevard & Brace Road (AM, PM, and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown (for those intersections affected by the driveway options):

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (PM and MD)

Based on the intersection queuing significant impact criteria presented in Section 2 (Project traffic causes queue overflow or if queues overflows under no Project, the Project contributes 5% of the total traffic for the movement), an intersection queue significant impact occurs at the following affected study area intersections:

- Sierra College Boulevard & Brace Road (PM and MD)[13]
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)

[13] Weekday PM and Weekend Midday peak hour impacted for Project Driveway Option 1B only.

6.1.3 Simulation Supplemental Evaluation

The Existing plus Project conditions simulation evaluation was conducted with the same assumptions as outlined in Section 4.0 for Existing Conditions and is provided for informational purposes only.

Project Driveway Option 1A

The total network performance results of the simulation runs for Project Driveway Option 1A are presented in Table 21 and the arterial performance results are presented in Table 22. Please note that signal timing was not modified with the addition of Project trips.

As shown, the Project traffic increases network delay for all peak hours. In addition, the increased congestion on the network results in vehicles being denied entry into the network during the simulation period.

Table 21: Existing Plus Project Conditions – Simulation Total Network Performance Results – Project Driveway Option 1A

Peak Hour	Existing				Existing Plus Project			
	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry
AM	46.8	5,333	5,325	0	44.7	5,707	5,661	0
PM	54.7	7,131	7,125	1	93.6	7,479	7,255	12
MD	40.0	5,795	5,797	0	58.9	6,722	6,652	1

Notes:
(s): seconds
Total Delay/Vehicle: Total delay is equal to the travel time minus the travel time for a vehicle with no other vehicles or control devices. This delay is divided by the number of vehicles to obtain the total delay per vehicle.

Vehicles Entered/Exited: Represents the number of vehicles counted entering and exiting the link or area during the interval. This value does not include vehicles moving from one intersection to the next with the arterial or network.

Vehicles Denied Entry: This value represents the number of vehicles unable to enter a link due to congestion and are waiting to enter. These vehicles can either be from an external link or from a mid-block source.

Source: Kittelson & Associates, Inc. 2019

As shown, for the Sierra College Boulevard corridor, the Project increases delay, travel time, and reduces arterial speed for all peak hours and direction.

Table 22: Existing Plus Project Conditions – Simulation Sierra College Boulevard Arterial Performance Results – Project Driveway Option 1A

Segment	Peak Hour	Direction	Existing			Existing Plus Project		
			Delay (s)	Travel Time (s)	Arterial Speed (mph)	Delay (s)	Travel Time (s)	Arterial Speed (mph)
Sierra College Boulevard between Taylor Road and Stadium Way	AM	Northbound	70.8	191.0	28	73.8	244.3	22
		Southbound	137.9	326.1	25	133.9	398.6	20
	PM	Northbound	138.2	257.2	21	190.7	366.1	14
		Southbound	123.9	309.8	26	259.2	526.0	16
	MD	Northbound	85.8	205.4	26	114.2	288.1	18
		Southbound	100.1	286.0	29	138.1	405.6	20

Notes:
Total Delay: Total Delay for the average vehicle traveling the length of the corridor including stopped delay and congestion delay.
Total Travel Time: Time in seconds for the average vehicle to travel the length of the corridor.
Average Arterial Speed: Average speed of the average vehicle traveling the length of the corridor.
Source: Kittelson & Associates, Inc. 2019

The detailed network and arterial performance output sheets are presented in Appendix "D".

Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C would affect operations along the Sierra College Boulevard Corridor due to the driveway trip routing; therefore Exiting plus Project conditions simulation evaluation was also conducted for Project Driveway Options 1B and 1C. The total network performance results of the simulation runs are presented in Table 23 and the arterial performance results are presented in Table 24. Please note that signal timing was not modified with the addition of Project trips.

As shown, the Project traffic increases network delay for all peak hours. In addition, the increased congestion on the network results in vehicles being denied entry into the network during the simulation period.

Table 23: Existing Plus Project Conditions – Simulation Total Network Performance Results – Project Driveway Options 1B & 1C

Peak Hour	Existing				Existing Plus Project			
	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry
Driveway Option 1B								
AM	46.8	5,333	5,325	0	50.3	5,744	5,722	2
PM	54.7	7,131	7,125	1	69.5	8,534	8,503	16
MD	40.0	5,795	5,797	0	48.6	7,414	7,392	2
Driveway Option 1C								
AM	46.8	5,333	5,325	0	45.0	5,827	5,771	0
PM	54.7	7,131	7,125	1	68.2	7,550	7,420	2
MD	40.0	5,795	5,797	0	52.0	6,735	6,678	1

Notes:
(s): seconds
Total Delay/Vehicle: Total delay is equal to the travel time minus the travel time for a vehicle with no other vehicles or control devices. This delay is divided by the number of vehicles to obtain the total delay per vehicle.

Vehicles Entered/Exited: Represents the number of vehicles counted entering and exiting the link or area during the interval. This value does not include vehicles moving from one intersection to the next with the arterial or network.

Vehicles Denied Entry: This value represents the number of vehicles unable to enter a link due to congestion and are waiting to enter. These vehicles can either be from an external link or from a mid-block source.

Source: Kittelson & Associates, Inc. 2019

As shown, for the Sierra College Boulevard corridor, the Project increases delay, travel time, and reduces arterial speed for all peak hours and direction. The detailed network and arterial performance output sheets are presented in Appendix "D".

Table 24: Existing Plus Project Conditions – Simulation Sierra College Boulevard Arterial Performance Results – Project Driveway Options 1B & 1C

Segment	Peak Hour	Direction	Existing			Existing Plus Project		
			Delay (s)	Travel Time (s)	Arterial Speed (mph)	Delay (s)	Travel Time (s)	Arterial Speed (mph)
Driveway Option 1B								
Sierra College Boulevard between Taylor Road and Stadium Way	AM	Northbound	70.8	191.0	28	80.1	199.2	27
		Southbound	137.9	326.1	25	163.8	349.4	23
	PM	Northbound	138.2	257.2	21	220.0	342.4	16
		Southbound	123.9	309.8	26	157.9	343.0	24
	MD	Northbound	85.8	205.4	26	114.3	242.6	22
		Southbound	100.1	286.0	29	127.6	318.6	26
Driveway Option 1C								
Sierra College Boulevard between Taylor Road and Stadium Way	AM	Northbound	70.8	191.0	28	77.4	248.1	21
		Southbound	137.9	326.1	25	137.0	402.6	20
	PM	Northbound	138.2	257.2	21	164.4	339.0	16
		Southbound	123.9	309.8	26	152.4	418.9	19
	MD	Northbound	85.8	205.4	26	106.6	280.4	19
		Southbound	100.1	286.0	29	130.3	396.1	21

Notes:
Total Delay: Total Delay for the average vehicle traveling the length of the corridor including stopped delay and congestion delay.
Total Travel Time: Time in seconds for the average vehicle to travel the length of the corridor.
Average Arterial Speed: Average speed of the average vehicle traveling the length of the corridor.
Source: Kittelson & Associates, Inc. 2019

6.2 PLACER COUNTY ROADWAY OPERATIONS

Analysis for the study segments was conducted using the LOS criteria defined as noted in Section 3.1. The three Project driveway options do not affect the Project traffic volumes for the roadway segments analyzed. Table 25 outlines the roadway volumes and associated level of service for the study segments and is applicable for all three Project driveway options. As shown, all study segments continue to satisfy the acceptable LOS C standard with the addition of Project trips regardless of the Project driveway option considered. Therefore, Project impacts would be less than significant.

Table 25: Existing Plus Project Conditions – Placer County Weekday ADT Roadway Segment LOS Analysis

Roadway	Segment	Number of Lanes	Existing		Existing Plus Project		
			ADT	LOS	Project ADT	ADT	LOS
Sierra College Boulevard (SCB)	SR-193 to English Colony Way	2	8,290	A	180	8,470	A
	English Colony Way to Delmar Ave	2	11,120	B	200	11,320	B
	Delmar Ave to Loomis Town Limits	2	11,120	B	220	11,340	B
SR-193	Lincoln City Limits to SCB	2	10,360	A	90	10,450	A
	SCB to Clark Tunnel Road	2	7,200	A	50	7,250	A

Notes:
ADT volumes sourced from Bickford Ranch Specific Plan EIR Addendum (October 2015) and adjusted based on City of Rocklin Travel Demand Model Growth Rates.
Source: Kittelson & Associates, Inc. 2019

6.3 FREEWAY FACILITIES EVALUATION

Existing conditions traffic volumes for the weekday AM and PM peak hours were added to the site-generated traffic to arrive at the Existing plus Project traffic volumes.

6.3.1 Freeway Mainline Basic Segment Analysis

The three Project driveway options do not affect the Project traffic volumes for the freeway segments analyzed. Table 26 through Table 28 outline the Existing and Existing plus Project mainline volume, density and associated level of service for the study segments and are applicable for all three Project driveway options. As shown, all study segments operate at acceptable LOS D or better with Project traffic regardless of the Project driveway option considered. Therefore, no significant impacts occur to the freeway mainline under the Existing Plus Project Conditions. Appendix "E" includes the freeway mainline level-of-service worksheets.

Table 26: Existing Plus Project Conditions – I-80 Mainline LOS Analysis, Weekday AM Peak Hour

ID	Segment	Direction	Existing			Existing Plus Project			Change in Density
			Volume	Density	LOS	Volume	Density	LOS	
1	I-80 east of Sierra College	Eastbound	3,110	19.0	C	3,132	19.1	C	0.1
		Westbound	4,062	25.4	C	4,085	25.6	C	0.2
2	I-80 west of Sierra College	Eastbound	3,118	19.1	C	3,125	19.1	C	0.0
		Westbound	3,702	22.9	C	3,709	23.0	C	0.1

Notes:
Density units: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

Table 27: Existing Plus Project Conditions – I-80 Mainline LOS Analysis, Weekday PM Peak Hour

ID	Segment	Direction	Existing			Existing Plus Project			Change in Density
			Volume	Density	LOS	Volume	Delay	LOS	
1	I-80 east of Sierra College	Eastbound	4,398	25.8	C	4,469	26.3	D	0.5
		Westbound	3,803	22.5	C	3,870	22.9	C	0.4
2	I-80 west of Sierra College	Eastbound	4,042	23.4	C	4,061	23.5	C	0.1
		Westbound	3,716	22.0	C	3,736	22.1	C	0.1

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

Table 28: Existing Plus Project Conditions – I-80 Mainline LOS Analysis, Weekend MD Peak Hour

ID	Segment	Direction	Existing			Existing Plus Project			Change in Density
			Volume	Density	LOS	Volume	Delay	LOS	
1	I-80 east of Sierra College	Eastbound	3,980	22.5	C	4,110	23.3	C	0.8
		Westbound	3,892	21.5	C	4,029	22.3	C	0.8
2	I-80 west of Sierra College	Eastbound	3,963	22.4	C	4,002	22.6	C	0.2
		Westbound	3,812	21.1	C	3,850	21.3	C	0.2

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

6.3.2 Ramp Metering Analysis

No ramp metering analysis was provided for the existing plus Project conditions because the ramp meter has not been activated.

6.4 PEDESTRIAN AND BICYCLE EVALUATION

The proposed Project would provide pedestrian facilities on-site linking with public facilities along the site frontages on Sierra College Boulevard and Brace Road to provide connectivity with existing facilities. Pedestrian crosswalks would be provided at proposed new signalized Costco site access intersection on Sierra College Boulevard. The project would reconstruct the Type II bicycle facility on Sierra College Boulevard northbound along the site frontage, including providing separate northbound right-turn lanes at the proposed signalized Project access and at Brace Road. In addition, the Project would provide bicycle parking on site for both members and employees.

Due to the nature of products and services provided by the Project, the Project would minimally increase pedestrian and bicycle traffic in the study area off-site. Sidewalk connections would be provided along the Project site frontage with the proposed development along Sierra College Boulevard. The Project site

would not be in conflict with applicable Town pedestrian and bicycle plans for any of the Project driveway options considered. The Project would have a less than significant impact on pedestrian and bicycle facilities.

6.5 TRANSIT EVALUATION

Due to the nature of products and services provided by the Project and limited transit connectivity provided adjacent to the site, the Project would minimally increase transit ridership in the study area. The nearest stop is approximately 0.6 mile from the Project site for routes with one hour and two hour headways. Due to the distance to the stop, relatively long bus headways, and employee shift times, it is unlikely that a significant number of employee trips would be added to the transit network. The project site would not be in conflict with applicable Placer County Transit plans or encroach on any lines or stops. The Project would have a less than significant impact on transit services and a new transit stop is not warranted at the Project site.

Project impacts on traffic flow could affect travel time for transit vehicles. Traffic flow impacts are addressed in the intersection evaluation sections of this study for all Project driveway options considered.

Section 7
Cumulative Conditions – Short Term Baseline

7.0 CUMULATIVE CONDITIONS – SHORT TERM BASELINE

The Cumulative Short Term Baseline traffic conditions analysis forecasts how the study area's transportation system would operate with the traffic generated by the approved/pending projects in the area prior to the proposed site development.

The Town of Loomis, the City of Rocklin, and Placer County collectively provided a list of approved/pending projects that would affect traffic volumes in the study area. Table 29 lists the approved/pending projects for the short term accounted for in the Cumulative Short Term Baseline traffic condition analysis. Appendix "H" provides *Trip Generation Manual* - based trip estimates for all approved/pending projects as estimated based on the data provided as well as a location map.

Table 29: Approved/Pending Projects List

ID	Name	Size	Traffic Study Source
1	Rocklin Crossings	83,000 square foot Shopping Center	Traffic Impact Analysis, Rocklin Crossings, LSA, March 2007
2	Rocklin Commons	120,000 square foot Shopping Center	Traffic Impact Analysis, Rocklin Commons, LSA, January 2009
3	Garnet Creek	81 single family homes and 260 multifamily dwelling units	N/A
4	Granite Dominguez Subdivision	71 single family homes	N/A
5	Los Cerros Subdivision	115 single family homes	N/A
6	Brighton Subdivision	72 single family homes	N/A
7	Rocklin 60	179 single family homes	Traffic Impact Analysis, Rocklin 60 Residential Project, LSA, May 2008
8	Croftwood	51 single family homes	N/A
9	Granite Terrace	42 single family homes	N/A
10	Avalon Subdivision	76 single family homes	N/A
11	Sierra Gateway Apartment	195 apartments	Sierra Gateway Apartments Transportation Impact Analysis Report, Omni Means, March 2017
12	Clover Valley Residential	558 single family homes	Recirculated Draft EIR Clover Valley LSLTSM, DKS Associates, January 2006
13	Parklands Subdivision	142 single family homes	N/A
14	The Center at Secret Ravine	16,000 square foot Shopping Center	N/A
15	Rocklin Gateway Apartment	204 apartments	Traffic Impact Analysis for Pacific Street/Midas Avenue Multi-Family Residential Project, KD Anderson & Associates, February 2017
16	Quarry Row Subdivision	64 single family homes	Traffic Impact Analysis for Quarry Row Subdivision, KD Anderson & Associates, January 2017

ID	Name	Size	Traffic Study Source
17	Sierra Pine Subdivision	199 single family homes	Final Transportation Impact Study for Sierra Pine Residential Project, Fehr & Peers, July 2017
18	Rocklin Station	33,000 square foot Shopping Center	Sierra College Boulevard Commercial Project, Abrams Associates, June 2017
19	Oak Vista Subdivision	63 single family homes	Traffic Impact Analysis for Oak Vista Subdivision, KD Anderson & Associates, November 2016
20	Croftwood 2	63 single family homes	N/A
21	Sierra Villages North (SCB Site)	349 single family homes, 14.8 acres Park	N/A
22	Sierra Villages South (Rocklin Road Site)	37 single family homes, 16.4 acres Park	N/A
23	Bickford Ranch Phase 1	Full project is 940 single family homes, 950 active-adult homes, 14.7 acres Recreation Center, 500 student elementary school. Phase 1 is approximately 50 percent of site.	Bickford Ranch Traffic Sufficiency Analysis Memorandum, Fehr & Peers, May 30, 2014
24	Amazing Facts	1,650 seat church	Traffic Impact Update for Amazing Facts, KD Anderson & Associates, July 16, 2012

The Villages of Loomis development is not anticipated to be constructed and occupied by the Project opening of 2020.
Source: Kittelson & Associates, Inc. 2019
N/A = not applicable/not available

Peak hour trips associated each of the approved pending projects were distributed through the study area using trip distribution percentages obtained from recently completed commercial and residential development project traffic studies in Rocklin. Because the proposed Project study area is larger than the study areas used in the other available development studies, trips were distributed throughout the larger study area using traffic patterns from existing counts, available traffic studies in the area, and engineering judgement.

Funded Transportation Improvements

Some of the existing study intersection configurations will be modified in association with Approved/Pending development projects. Specifically, a western approach would be added on Schriber Way at Sierra College Boulevard and the intersection of Sierra College Boulevard/Schriber Way would be signalized by the Rocklin Station project.

In addition to the approved/pending development projects noted above, the Town of Loomis has a funded widening of Sierra College Boulevard between Brace Road and Taylor Road identified in the adopted 2018-2023 Capital Facility Plan. The Town's roadway project is expected to widen the roadway to provide three northbound vehicle travel lanes, three southbound vehicle travel lanes, as well as a Class II bicycle facility both northbound and southbound for the length of the project. The northbound approach of Sierra College Boulevard at Taylor Road will provide a separate left-turn lane, two through lanes, and a separate northbound right-turn lane with traffic signal overlap plus the separate bicycle lane. The southbound approach of Sierra College Boulevard at Brace Road will provide a left-turn lane, two through lanes, and interim de-facto right-turn trap lane (to later be restriped as a shared through/right-

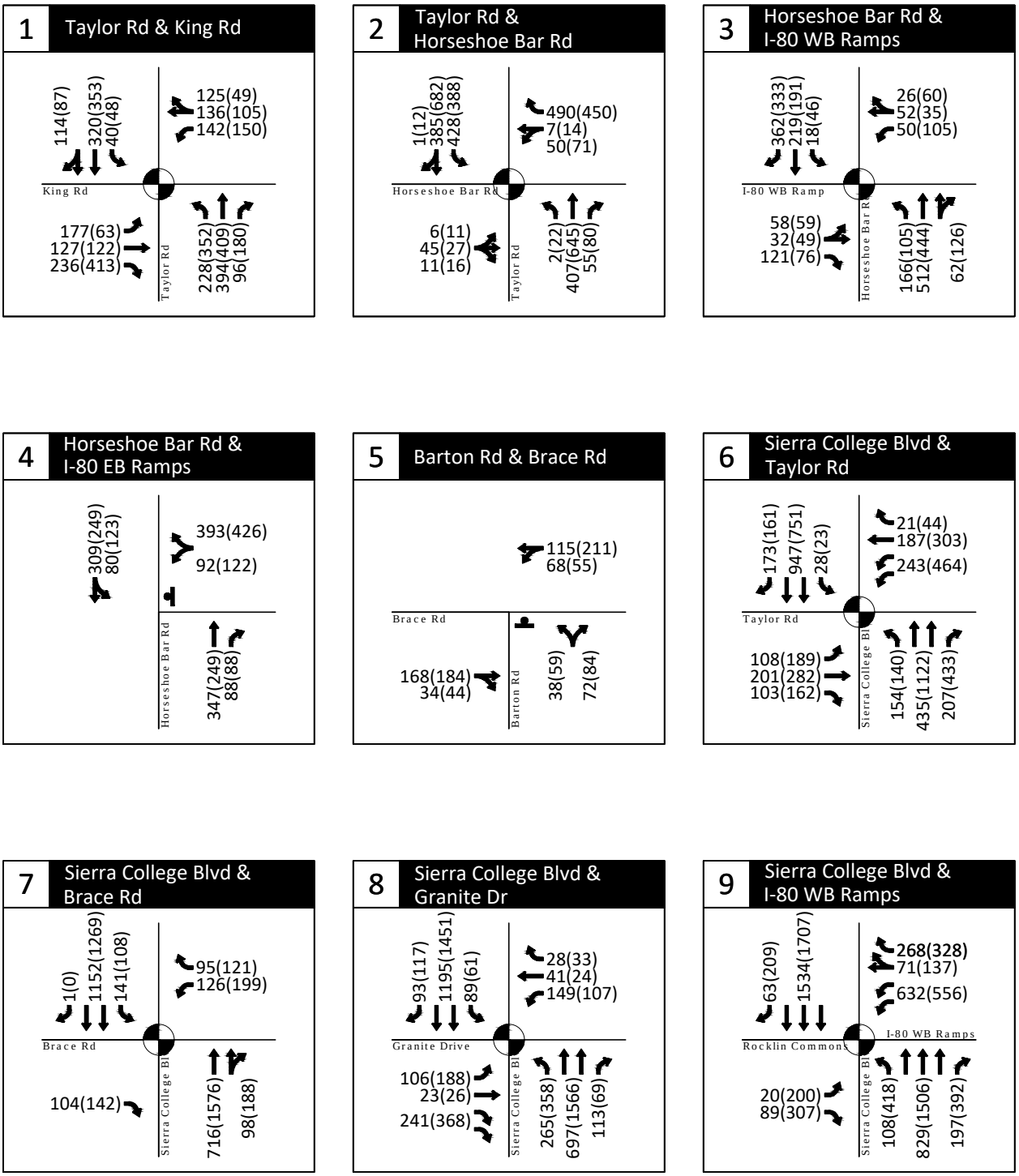
turn lane by others) as well as a separate bicycle lane. Construction of the Town's roadway widening project is expected in 2020-2021.

The planned/funded improvements were assumed to be completed in conjunction with the approved pending development project.

7.1 INTERSECTION EVALUATION

Weekday AM and PM as well as weekend midday peak hours associated with the approved/pending projects were added to the existing conditions traffic volumes to derive the Cumulative Short Term Baseline traffic volumes. Given the number of approved/pending projects contributing trips to the study area, the traffic signal timing at the study intersections was optimized for the Cumulative Short Term Baseline conditions. Per Caltrans staff direction, the I-80 ramps at Sierra College Boulevard were analyzed with coordination timing as determined by the Synchro software.

Figure 20 shows the Cumulative Short Term Baseline traffic condition during the weekday AM and PM peak hours while Figure 21 shows the Cumulative Short Term Baseline traffic condition during the weekend midday peak hour.



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
20A

KITTELSON & ASSOCIATES

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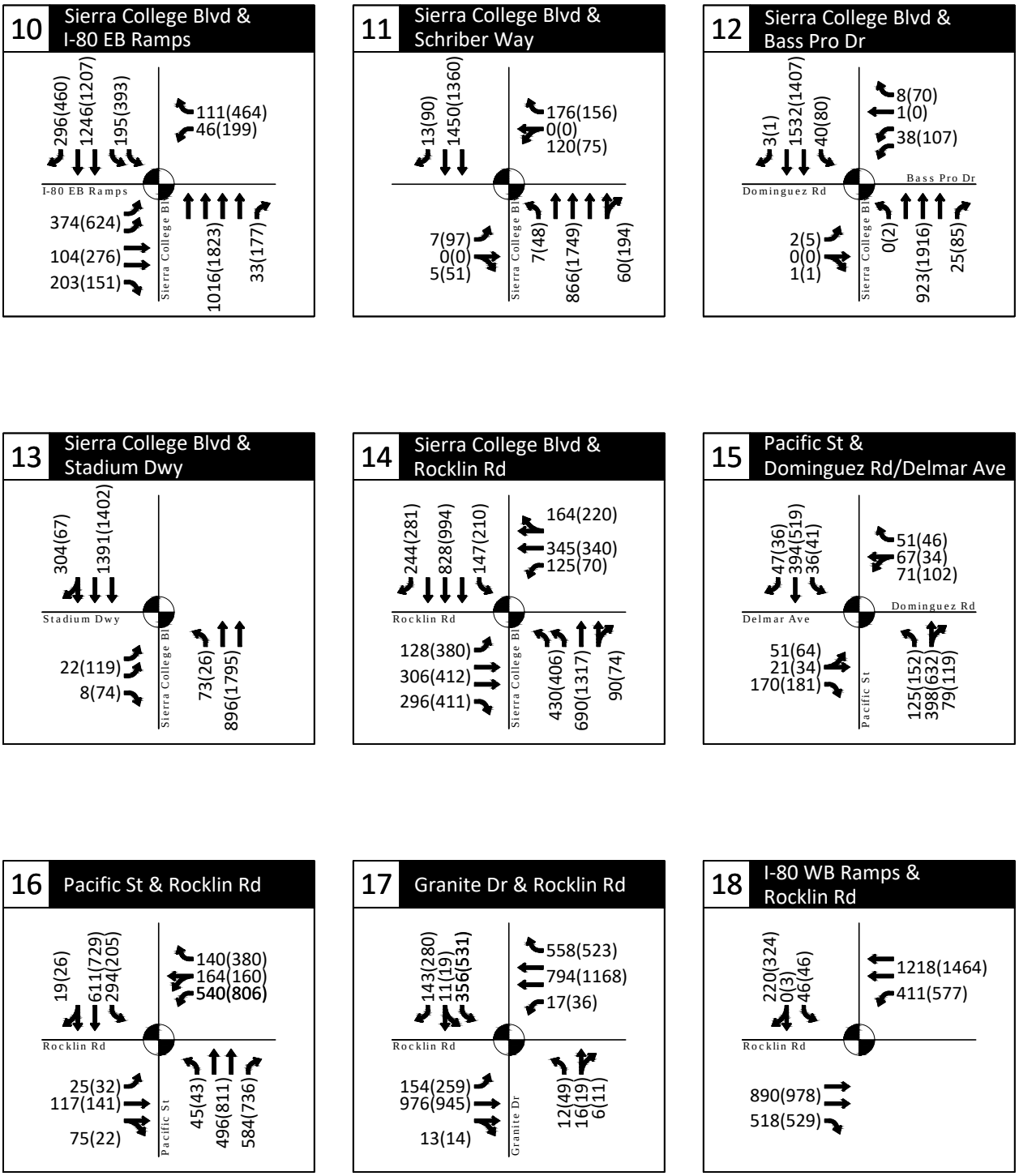


AM(PM) - Weekday Traffic Volume

- Stop Sign

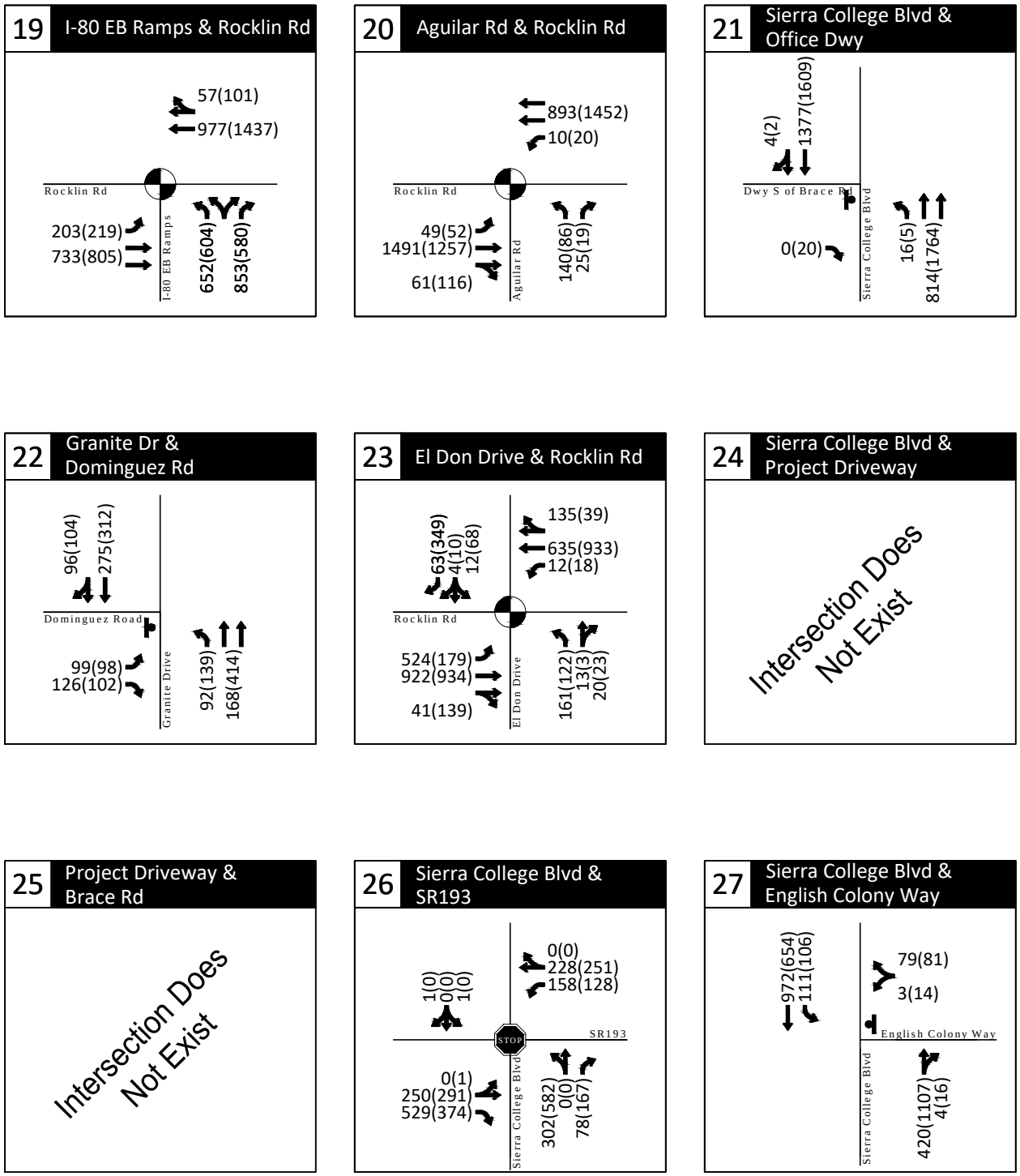
- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
20B

KITTELSON & ASSOCIATES

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:17pm - aloveday Layout Tab: CumSh AM_PM B



AM(PM) - Weekday Traffic Volume

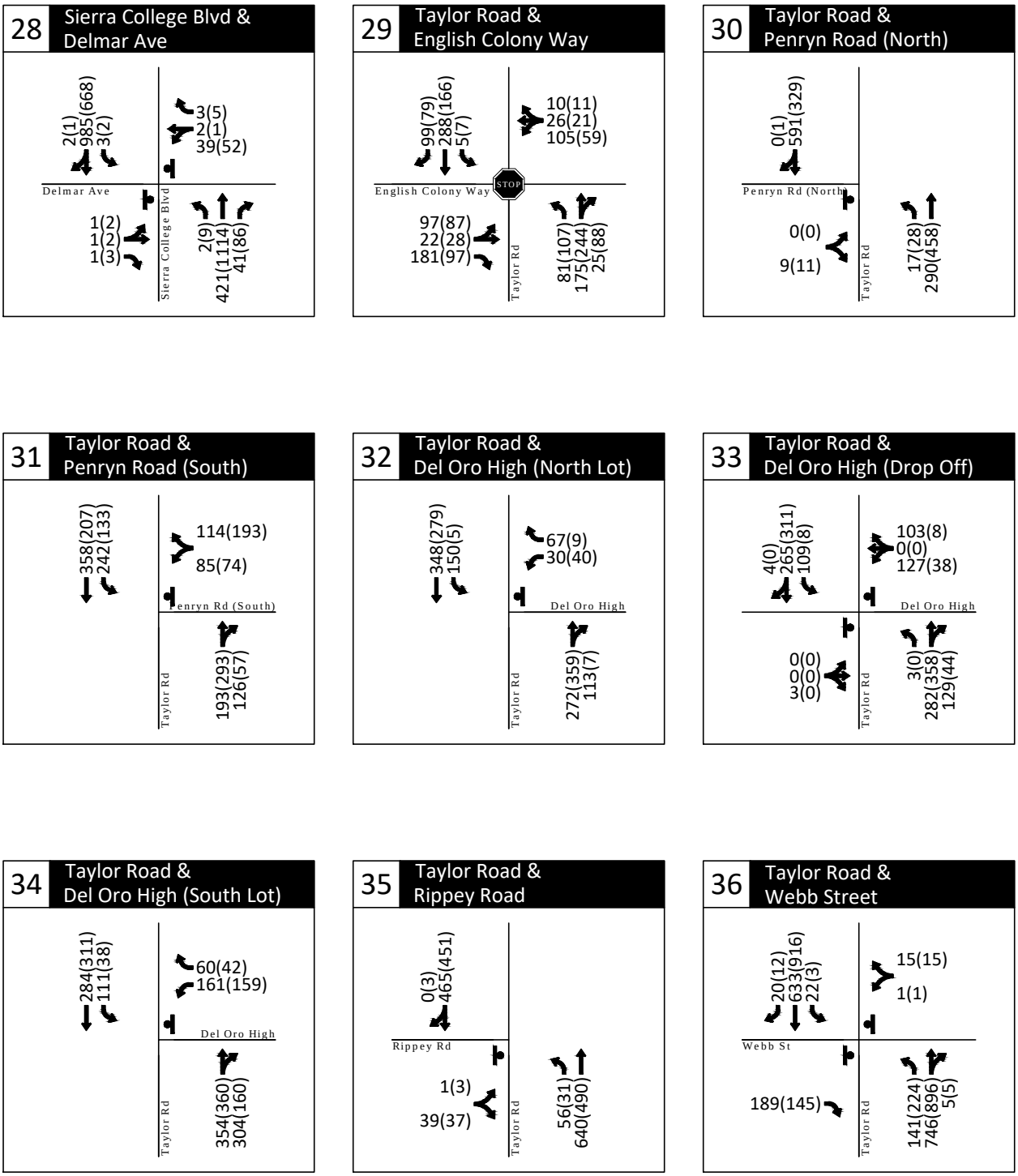
- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
20C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:17pm - aloveday Layout Tab: CumSh AM_PM C



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
20D

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37	Project Driveway East & Brace Road

Intersection Does Not Exist

AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
20E

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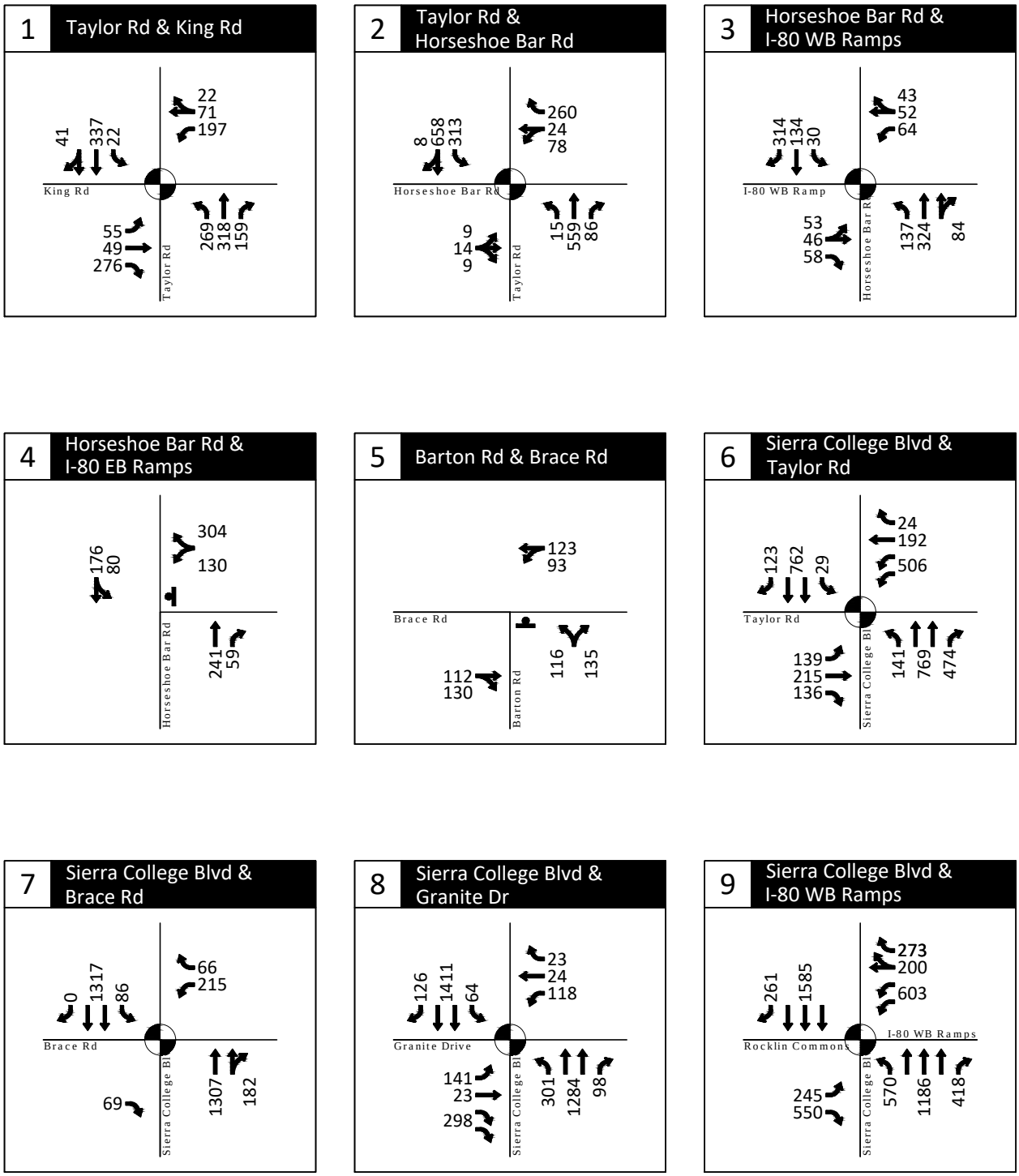

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
21A

KITTELSON & ASSOCIATES

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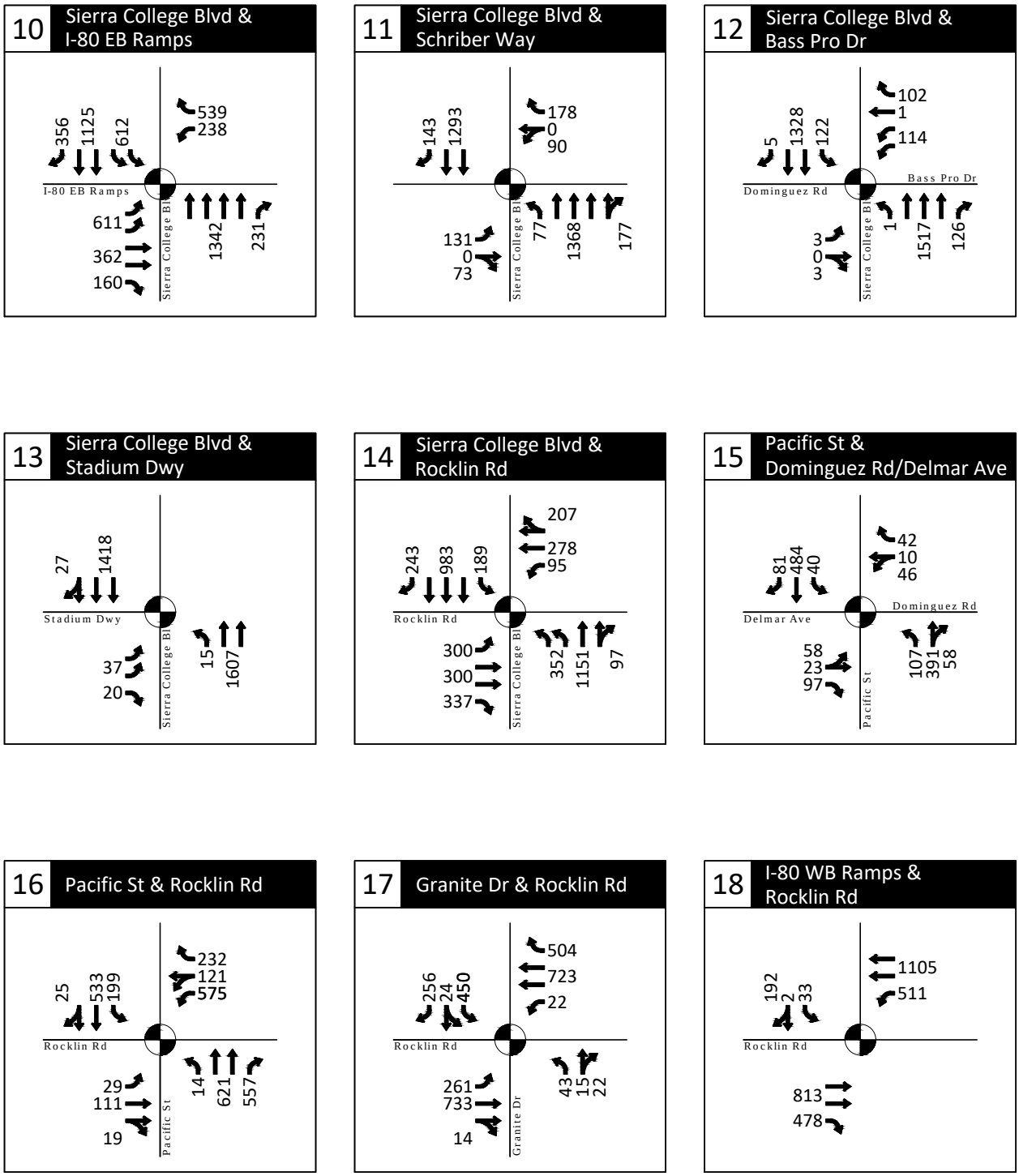

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
21B

KITTELSON & ASSOCIATES

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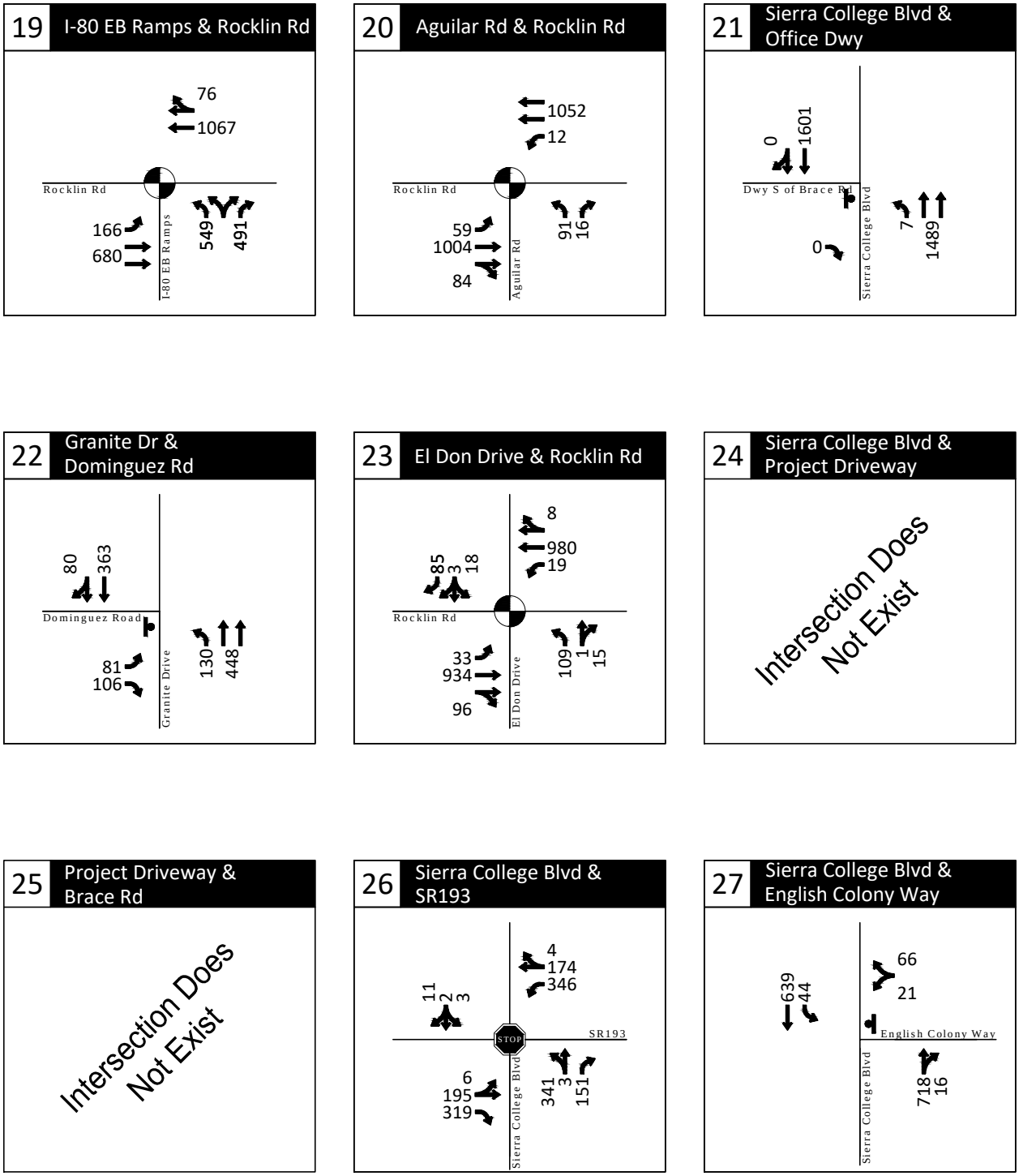

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
21C

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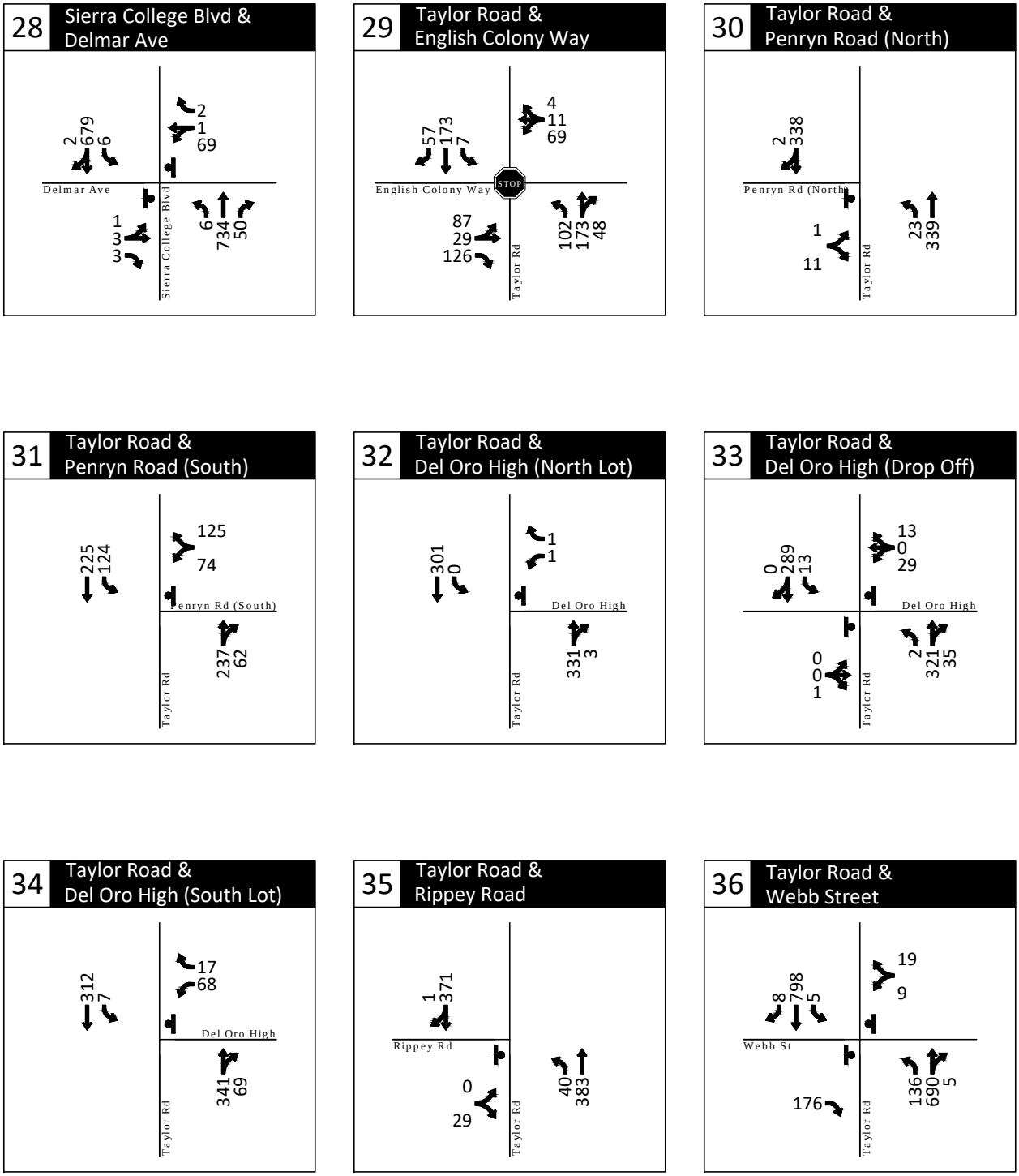


- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
21D

KITTELSON & ASSOCIATES

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:19pm - aloveday Layout Tab: CumSh SAT D

37	Project Driveway East & Brace Road
Intersection Does Not Exist	

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
21E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:20pm - aloveday Layout Tab: CumSh SAT E

7.1.1 Level-of-Service Analysis

Table 30 summarizes the LOS analysis for the study intersections under Cumulative Short Term Baseline conditions. Please note that the delays at some study intersections may be lower when compared to existing conditions due to signal timing optimization and/or recirculation of traffic due to the addition approved/pending projects.

As shown in Table 30, the following intersections would operate at unacceptable LOS:

- Taylor Road & King Road (PM)
- Horseshoe Bar Road & I-80 Eastbound Ramp (AM and PM)
- Sierra College Boulevard & Taylor Road (PM)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & Rocklin Road (AM, PM, and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (AM and PM)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (PM)
- Sierra College Boulevard & SR-193 (AM, PM, and MD)
- Sierra College Boulevard & English Colony Way (PM and MD)
- Sierra College Boulevard & Delmar Avenue (AM, PM, and MD)
- Taylor Road & Penryn Road (South) (AM and PM)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM and MD)
- Taylor Road & Del Oro High School South Lot (AM)
- Taylor Road & Webb Street (AM, PM, and MD)

Appendix “B” includes the level-of-service worksheets.

Table 30: Cumulative Short Term Baseline Conditions - Intersection LOS Analysis, Weekday AM/PM and Weekend Midday Peak Hour

ID	Intersection	Traffic Control Type	Weekday AM		Weekday PM		Weekend MD	
			Delay	LOS	Delay	LOS	Delay	LOS
1	Taylor Rd/King Rd	Signal	38.9	D	**59.8**	**E**	42.5	D
2	Taylor Rd/Horseshoe Bar Rd	Signal	23.3	C	30.0	C	20.1	C
3	Horseshoe Bar Rd/I-80 Westbound Ramp	Signal	13.7	B	14.0	B	13.4	B
4	Horseshoe Bar Rd/I-80 Eastbound Ramp	TWSC	**70.2**	**F**	**68.2**	**F**	28.7	D
5	Barton Rd/Brace Rd	TWSC	11.8	B	12.9	B	17.0	C
6	Sierra College Blvd/Taylor Rd	Signal	29.5	C	**40.5**	**D**	31.7	C
7	Sierra College Blvd/Brace Rd	Signal	10.7	B	18.3	B	15.1	B
8	Sierra College Blvd/Granite Dr	Signal	**35.9**	**D**	**58.2**	**E**	**39.9**	**D**
9	Sierra College Blvd/I-80 WB Ramps	Signal	34.3	C	66.5	E	76.5	E
10	Sierra College Blvd/I-80 EB Ramps	Signal	23.9	C	43.6	D	55.5	E
11	Sierra College Blvd/Schriber Way	Signal	15.3	B	17.0	B	20.8	C
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	7.2	A	12.2	B	13.3	B
13	Sierra College Blvd/Stadium Dwy	Signal	7.2	A	7.1	A	5.7	A
14	Sierra College Blvd/Rocklin Rd	Signal	**99.6**	**F**	**90.0**	**F**	**60.1**	**E**
15	Pacific St/Dominguez Rd-Delmar Ave	Signal	**43.6**	**D**	**67.3**	**E**	32.1	C
16	Pacific St/Rocklin Rd	Signal	**88.7**	**F**	**78.9**	**E**	**48.7**	**D**
17	Granite Dr/Rocklin Rd	Signal	27.6	C	**43.7**	**D**	32.4	C
18	I-80 Westbound Ramps/Rocklin Rd	Signal	23.6	C	53.7	D	24.9	C
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	35.5	D	44.6	D	25.3	C
20	Aguilar Rd/Rocklin Rd	Signal	11.3	B	9.4	A	8.6	A
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.2	A	17.6	C	0.1	A
22	Granite Dr/Dominguez Rd	TWSC	14.0	B	21.5	C	19.5	C
23	El Don Dr/Rocklin Rd	Signal	34.7	C	33.9	C	15.4	B
26	Sierra College Blvd/SR-193	AWSC	**41.8**	**E**	**79.4**	**F**	**48.0**	**E**
27	Sierra College Blvd/English Colony Way	TWSC	14.0	B	**78.8**	**F**	**25.5**	**D**
28	Sierra College Blvd/Delmar Avenue	TWSC	**103.3**	**F**	**328.6**	**F**	**145.2**	**F**
29	Taylor Rd/English Colony Way	AWSC	23.6	C	16.0	C	24.8	C
30	Taylor Rd/Penryn Road (North)	TWSC	14.6	B	10.5	B	10.9	B
31	Taylor Rd/Penryn Road (South)	TWSC	**347.2**	**F**	**25.7**	**D**	17.7	C
32	Taylor Rd/Del Oro High School North Lot	TWSC	**40.0**	**E**	14.0	B	19.5	C
33	Taylor Rd/Del Oro High School Drop-Off	TWSC	**358.0**	**F**	17.4	C	**42.3**	**E**

ID	Intersection	Traffic Control Type	Weekday AM		Weekday PM		Weekend MD	
			Delay	LOS	Delay	LOS	Delay	LOS
34	Taylor Rd/Del Oro High School South Lot	TWSC	**48.0**	**E**	18.7	C	23.1	C
35	Taylor Rd/Rippey Road	TWSC	14.3	B	12.3	B	14.4	B
36	Taylor Rd/Webb Street	TWSC	**25.2**	**D**	**59.1**	**F**	**8006.9**	**F**

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Source: Kittelson & Associates, Inc. 2019

7.1.2 Queuing Analysis

Appendix C provides the queue summary for the weekday AM, PM and weekend midday peak hours. The queues at the following intersections would extend beyond the storage lengths available at these locations:

- Taylor Road & King Road (AM, PM, and MD)
- Taylor Road & Horseshoe Bar Road (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Westbound Ramp (AM, PM, and MD)
- Sierra College Boulevard & Taylor Road (AM, PM, and MD)
- Sierra College Boulevard & Brace Road (PM and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (AM, PM, and MD)
- Sierra College Boulevard & I-80 EB Ramps (PM and MD)
- Sierra College Boulevard & Schriber Way (AM, PM, and MD)
- Sierra College Boulevard & Rocklin Road (AM, PM, and MD)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (PM and MD)
- I-80 Eastbound Ramps & Rocklin Road (AM and PM)
- Aguilar Road & Rocklin Road (AM and PM)
- El Don Drive & Rocklin Road (AM)
- Sierra College Boulevard & SR-193 (MD)
- Taylor Road & English Colony Way (AM and MD)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The northbound left-turn at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- The northbound through at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (AM, PM and MD)
- The southbound through at Sierra College Boulevard & Schriber Way would affect operations at Sierra College Boulevard & I-80 EB Ramps (AM, PM, and MD)
- The westbound left at I-80 Westbound Ramps & Rocklin Road would affect operations at I-80 Eastbound Ramps & Rocklin Road (PM)
- The westbound through at I-80 Eastbound Ramps & Rocklin Road would affect operations at Aguilar Road & Rocklin Road (AM and PM)
- The eastbound through at Aguilar Road & Rocklin Road would affect operations at I-80 Eastbound Ramps & Rocklin Road (AM)

7.2 PLACER COUNTY ROADWAY OPERATIONS

Analysis for the study segments was conducted using the LOS criteria defined as noted in Section 3.1. Table 31 outlines the roadway volume and associated level of service for the study segments. As shown, all study segments satisfy the LOS C or better standard.

Table 31: Cumulative Short Term Conditions – Placer County Weekday ADT Roadway Segment LOS Analysis

Roadway	Segment	Number of Lanes	ADT	LOS
Sierra College Boulevard (SCB)	SR-193 to English Colony Way	2	9,040	A
	English Colony Way to Delmar Ave	2	12,130	B
	Delmar Ave to Loomis Town Limits	2	12,130	B
SR-193	Lincoln City Limits to SCB	2	11,300	B
	SCB to Clark Tunnel Road	2	7,850	A

Notes:
ADT volumes sourced from Bickford Ranch Specific Plan EIR Addendum (October 2015) and adjusted based on City of Rocklin Travel Demand Model Growth Rates. Source:
Kittelson & Associates, Inc. 2018

7.3 FREEWAY FACILITIES EVALUATION

Freeway mainline traffic volumes were calculated by adding approved/pending project trips to the existing data collected from PeMS.

7.3.1 Freeway Mainline Basic Segment Analysis

Table 32 outlines the Short Term Cumulative mainline volume, density and associated level of service for the study segments. As shown, all study segments operate at acceptable LOS D or better.

Appendix "E" includes the freeway mainline level-of-service worksheets.

Table 32: Cumulative Short Term Baseline Conditions – I-80 Mainline LOS Analysis, Weekday AM/PM Peak Hours

ID	Segment	Direction	Weekday AM			Weekday PM			Weekend MD		
			Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS
1	I-80 east of Sierra College Boulevard	Eastbound	3,288	20.1	C	4,564	29.0	D	4,187	23.8	C
		Westbound	4,134	26.0	C	4,068	25.5	C	4,243	23.6	C
2	I-80 west of Sierra College Boulevard	Eastbound	3,216	19.7	C	4,419	27.8	D	4,392	25.1	C
		Westbound	3,923	24.4	C	4,016	25.1	C	4,198	23.3	C

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

7.3.2 Ramp Metering Supplemental Evaluation

The evalaution was prepared for informational purposes. Table 33 shows the calculated queues in feet and the minimum metering rate in vehicles per hour. The generated queues are accommodated within the available 1,200-foot long storage area.

Appendix "I" includes the ramp metering worksheets.

Table 33: Cumulative Short Term Baseline Conditions – I-80 Westbound Slip-Ramp Ramp Meter Analysis

Peak Hour	Meter Rate (vehicles/hour)	Calculated Queue (feet)
AM	240	11
PM	300	134
MD	300	0

Notes:
Boldface type indicates if queue exceeds available ramp storage capacity of 1,200 feet.
Source: Kittelson & Associates, Inc. 2019

7.4 PEDESTRIAN AND BICYCLE EVALUATION

No pedestrian or bicycle facility improvements were programmed under Cumulative Short Term Conditions beyond typical frontage improvements associated with approved development projects.

7.5 TRANSIT EVALUATION

No transit service improvements were programmed under Cumulative Short Term Conditions. The effect of approved in-process development on traffic flow could affect travel time for transit vehicles. Traffic flow effects due to approved in-process development are addressed in the intersection evaluation sections of this study.

Section 8
Cumulative Conditions – Short Term Plus Project

8.0 CUMULATIVE CONDITIONS – SHORT TERM PLUS PROJECT

The Cumulative Short Term plus Project traffic conditions analysis forecasts how the study area's transportation system would operate with the traffic generated by the proposed Costco development.

8.1 INTERSECTION EVALUATION

Development of the proposed Costco Project would include construction of multiple access points and several roadway capacity improvement measures. The changes to be constructed are detailed in Sections 5.1 and 5.1.2 of this report and include widening of Sierra College Boulevard to three lanes northbound between Granite Drive and Brace Road, signalization of the Sierra College Boulevard Project access, addition of northbound turn lanes on Sierra College Boulevard at the new traffic signal and Brace Road, changes to the Brace Road site frontage, and reconfiguration of Granite Drive east of Sierra College Boulevard (Project Driveway Options B and C only).

Cumulative Short Term Baseline Conditions traffic volumes for the weekday AM and PM as well as weekend midday peak hours were added to the site-generated traffic to arrive at the Short Term plus Project traffic volumes.

Figure 22 shows the Cumulative Short Term plus Project (Project Driveway Option 1A) traffic condition during weekday AM and PM peak hours and Figure 23 shows the Cumulative Short Term plus Project (Project Driveway Option 1A) traffic condition during the weekend midday peak hour. Project Driveway Options 1B and 1C would affect Cumulative Short Term plus Project traffic volumes at study intersections 7, 8, 21, 24, 25, and 37 due to the driveway trip routing. All other study intersections would have the same Cumulative Short Term plus Project traffic volumes under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Figure 24 shows the Cumulative Short Term plus Project traffic condition during the weekday AM and PM peak hours for all three Project driveway options at those study intersections affected by the options. Figure 25 shows the Cumulative Short Term plus Project Alternative traffic condition during the weekend midday peak hour for all three Project driveway options at those study intersections affected by the options.

8.1.1 Level-of-Service Analysis

To gauge the impact of the Project traffic on the roadway network, the Project analysis assumed that study intersection signal timings would be unchanged from those in baseline conditions (including coordination timing at the I-80 ramps at Sierra College Boulevard) except at study locations where the Project provides geometric improvements.

Project Driveway Option 1A

Table 34 shows the baseline Cumulative Short Term No-Project and Plus Project (Project Driveway Option 1A) delays and LOS for the study intersections during the weekday AM and PM peak hours. Table 35 shows the baseline Cumulative Short Term No-Project and Plus Project (Project Driveway Option 1A)

delays and LOS for the study intersections during the weekend midday peak hour. Please note that the delays at some study intersections may be lower when compared to existing or existing plus Project conditions due to geometric improvements and corresponding signal timing optimization and/or recirculation of traffic associated with the addition of approved/pending projects.

As shown in the tables below, the following intersections operate at unacceptable LOS:

- Taylor Road & King Road (PM)
- Horseshoe Bar Road & I-80 Eastbound Ramp (AM and PM)
- Sierra College Boulevard & Taylor Road (PM and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 Westbound Ramps (PM and MD)
- Sierra College Boulevard & Rocklin Road (AM, PM, and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (AM, PM, and MD)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (PM and MD)
- Sierra College Boulevard & SR-193 (AM, PM, and MD)
- Sierra College Boulevard & English Colony Way (PM and MD)
- Sierra College Boulevard & Delmar Avenue (AM, PM, and MD)
- Taylor Road & English Colony Way (MD)
- Taylor Road & Penryn Road (South) (AM and PM)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM and MD)
- Taylor Road & Del Oro High School South Lot (AM)
- Taylor Road & Webb Street (AM, PM, and MD)

Based on the impact criteria defined earlier, the following intersections would be significantly impacted by the proposed Project:

- Sierra College Boulevard & Taylor Road (MD)
- Sierra College Boulevard & Granite Drive (PM and MD)
- Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (MD)
- Granite Drive & Rocklin Road (MD)
- Sierra College Boulevard & SR-193 (PM and MD)
- Sierra College Boulevard & English Colony Way (PM and MD)
- Taylor Road & English Colony Way (MD)

- Taylor Road & Penryn Road (South) (AM)
- Taylor Road & Webb Street (MD)

Appendix "B" includes the level-of-service worksheets.

Table 34: Cumulative Short Term Plus Project - Intersection LOS Analysis, Weekday AM/PM Peak Hour – Project Driveway Option 1A

ID	Intersection	Traffic Control Type	Weekday AM				Change in Delay (sec)	Weekday PM				Change in Delay (sec)
			Short Term		plus Project			Short Term		plus Project		
			Delay (Sec)	LOS	Delay (Sec)	LOS		Delay (Sec)	LOS	Delay (Sec)	LOS	
1	Taylor Rd/ King Rd	Signal	38.9	D	39.5	D	0.6	**59.8**	**E**	**62.0**	**E**	2.2
2	Taylor Rd/ Horseshoe Bar Rd	Signal	23.3	C	23.6	C	0.3	30.0	C	31.6	C	1.6
3	Horseshoe Bar Rd/ I-80 Westbound Ramp	Signal	13.7	B	13.7	B	0.0	14.0	B	14.0	B	0.0
4	Horseshoe Bar Rd/ I-80 Eastbound Ramp[1]	TWSC	**70.2**	**F**	**70.2**	**F**	0.0	**68.2**	**F**	**68.2**	**F**	0.0
5	Barton Rd/Brace Rd	TWSC	11.8	B	11.9	B	0.1	12.9	B	13.1	B	0.2
6	Sierra College Blvd/ Taylor Rd	Signal	29.5	C	30.3	C	0.8	**40.5**	**D**	**44.1**	**D**	3.6
7	Sierra College Blvd/ Brace Rd	Signal	10.7	B	14.1	B	3.4	18.3	B	16.9	B	-1.4
8	Sierra College Blvd/ Granite Dr	Signal	**35.9**	**D**	**36.7**	**D**	0.8	**58.2**	**E**	**105.1**	**F**	46.9
9	Sierra College Blvd/ I-80 WB Ramps	Signal	34.3	C	41.9	D	7.6	66.5	E	**96.6**	**F**	30.1
10	Sierra College Blvd/ I-80 EB Ramps	Signal	23.9	C	24.2	C	0.3	43.6	D	45.2	D	1.6
11	Sierra College Blvd/ Schriber Way	Signal	15.3	B	15.3	B	0.0	17.0	B	17.1	B	0.1
12	Sierra College Blvd/ Bass Pro Dr-Dominguez Rd	Signal	7.2	A	7.3	A	0.1	12.2	B	12.4	B	0.2
13	Sierra College Blvd/ Stadium Dwy	Signal	7.2	A	7.2	A	0.0	7.1	A	7.2	A	0.1
14	Sierra College Blvd/ Rocklin Rd	Signal	**99.6**	**F**	**99.7**	**F**	0.1	**90.0**	**F**	**92.4**	**F**	2.4
15	Pacific St/ Dominguez Rd-Delmar Ave	Signal	**43.6**	**D**	**44.0**	**D**	0.4	**67.3**	**E**	**68.3**	**E**	1.0
16	Pacific St/ Rocklin Rd	Signal	**88.7**	**F**	**89.0**	**F**	0.3	**78.9**	**E**	**80.0**	**E**	1.1
17	Granite Dr/ Rocklin Rd	Signal	27.6	C	27.7	C	0.1	**43.7**	**D**	**45.2**	**D**	1.5
18	I-80 WB Ramps/ Rocklin Rd	Signal	23.6	C	23.6	C	0.0	53.7	D	53.7	D	0.0
19	I-80 Eastbound Ramps/ Rocklin Rd	Signal	35.5	D	35.5	D	0.0	44.6	D	44.6	D	0.0
20	Aguilar Rd/ Rocklin Rd	Signal	11.3	B	11.4	B	0.1	9.4	A	9.5	A	0.1
21	Sierra College Blvd/ Dwy South of Brace Rd	TWSC	0.2	A	0.2	A	0.0	17.6	C	18.2	C	0.6
22	Granite Dr/ Dominguez Rd	TWSC	14.0	B	14.1	B	0.1	21.5	C	22.1	C	0.6

ID	Intersection	Traffic Control Type	Weekday AM				Change in Delay (sec)	Weekday PM				Change in Delay (sec)
			Short Term		plus Project			Short Term		plus Project		
			Delay (Sec)	LOS	Delay (Sec)	LOS		Delay (Sec)	LOS	Delay (Sec)	LOS	
23	El Don Dr/ Rocklin Rd	Signal	34.7	C	34.8	C	0.1	33.9	C	34.0	C	0.1
24	Sierra College Boulevard/ Project Driveway	Signal	DNE		6.6	A	-	DNE		13.5	B	-
25	Brace Road/ Project Driveway	TWSC	DNE		0.0	A	-	DNE		10.1	B	-
26	Sierra College Blvd/ SR-193	AWSC	**41.8**	**E**	**43.3**	**E**	1.5	**79.4**	**F**	**83.1**	**F**	3.7
27	Sierra College Blvd/ English Colony Way	TWSC	14.0	B	14.9	B	0.9	**78.8**	**F**	**97.7**	**F**	18.9
28	Sierra College Blvd/ Delmar Avenue[2]	TWSC	**103.3**	**F**	**108.4**	**F**	5.1	**328.6**	**F**	**388.4**	**F**	59.8
29	Taylor Rd/ English Colony Way	AWSC	23.6	C	23.9	C	0.3	16.0	C	16.2	C	0.2
30	Taylor Rd/ Penryn Road (North)	TWSC	14.6	B	14.6	B	0.0	10.5	B	10.5	B	0.0
31	Taylor Rd/ Penryn Road (South)	TWSC	**347.2**	**F**	**354.9**	**F**	7.7	**25.7**	**D**	**27.3**	**D**	1.6
32	Taylor Rd/ Del Oro High School North Lot[1]	TWSC	**40.0**	**E**	**40.8**	**E**	0.8	14.0	B	14.2	B	0.2
33	Taylor Rd/ Del Oro High School Drop-Off[1]	TWSC	**358.0**	**F**	**365.5**	**F**	7.5	17.4	C	17.7	C	0.3
34	Taylor Rd/ Del Oro High School South Lot[1]	TWSC	**48.0**	**E**	**48.5**	**E**	0.5	18.7	C	18.9	C	0.2
35	Taylor Rd/ Rippey Road	TWSC	14.3	B	14.3	B	0.0	12.3	B	12.4	B	0.1
36	Taylor Rd/ Webb Street[1]	TWSC	**25.2**	**D**	**25.9**	**D**	0.7	**59.1**	**F**	**66.4**	**F**	7.3
37	Sierra College Boulevard/ Project Driveway East	TWSC	DNE		10.4	B	-	DNE		11.2	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates Project impact
[1] An impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection. At these locations, the project does not contribute 5% or more of the volumes.
[2] Intersection does not meet signal warrants for impacts condition, therefore per the Placer County guidelines, this intersection is not significantly impacted. Traffic signal warrants provided in Appendix J.
Source: Kittelson & Associates, Inc. 2019

Table 35: Cumulative Short Term Plus Project - Intersection LOS Analysis, Weekend Midday Peak Hour – Project Driveway Option 1A

ID	Intersection	Traffic Control Type	Short Term		plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay	LOS	
1	Taylor Rd/King Rd	Signal	42.5	D	48.8	D	6.3
2	Taylor Rd/Horseshoe Bar Rd	Signal	20.1	C	22.0	C	1.9
3	Horseshoe Bar Rd/I-80 Westbound Ramp	Signal	13.4	B	13.4	B	0.0
4	Horseshoe Bar Rd/I-80 Eastbound Ramp	TWSC	28.7	D	28.7	D	0.0
5	Barton Rd/Brace Rd	TWSC	17.0	C	18.0	C	1.0
6	Sierra College Blvd/Taylor Rd	Signal	31.7	C	**38.9**	**D**	7.2
7	Sierra College Blvd/Brace Rd	Signal	15.1	B	17.4	B	2.3
8	Sierra College Blvd/Granite Dr	Signal	**39.9**	**D**	**75.1**	**E**	35.2
9	Sierra College Blvd/I-80 WB Ramps	Signal	76.5	E	**126.6**	**F**	50.1
10	Sierra College Blvd/I-80 EB Ramps	Signal	55.5	E	43.1	D	-12.4[4]
11	Sierra College Blvd/Schriber Way	Signal	20.8	C	21.0	C	0.2
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	13.3	B	13.5	B	0.2
13	Sierra College Blvd/Stadium Dwy	Signal	5.7	A	6.0	A	0.3
14	Sierra College Blvd/Rocklin Rd	Signal	**60.1**	**E**	**64.4**	**E**	4.3
15	Pacific St/Dominguez Rd-Delmar Ave	Signal	32.1	C	**35.4**	**D**	3.3
16	Pacific St/Rocklin Rd	Signal	**48.7**	**D**	**50.6**	**D**	1.9
17	Granite Dr/Rocklin Rd	Signal	32.4	C	**35.2**	**D**	2.8
18	I-80 Westbound Ramps/Rocklin Rd	Signal	24.9	C	24.9	C	0.0
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	25.3	C	25.3	C	0.0
20	Aguilar Rd/Rocklin Rd	Signal	8.6	A	8.7	A	0.1
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
22	Granite Dr/Dominguez Rd	TWSC	19.5	C	20.4	C	0.9
23	El Don Dr/Rocklin Rd	Signal	15.4	B	15.7	B	0.3
24	Sierra College Boulevard/Project Driveway	Signal	DNE		16.0	B	-
25	Brace Road/Project Driveway	TWSC	DNE		9.9	A	-
26	Sierra College Blvd/SR-193	AWSC	**48.0**	**E**	**54.0**	**F**	6.0
27	Sierra College Blvd/English Colony Way	TWSC	**25.5**	**D**	**30.3**	**D**	4.8
28	Sierra College Blvd/Delmar Avenue[2]	TWSC	**145.2**	**F**	**205.3**	**F**	60.1
29	Taylor Rd/English Colony Way	AWSC	24.8	C	**27.5**	**D**	2.7
30	Taylor Rd/Penryn Road (North)	TWSC	10.9	B	11.0	B	0.1
31	Taylor Rd/Penryn Road (South)	TWSC	17.7	C	18.9	C	1.2

ID	Intersection	Traffic Control Type	Short Term		plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay	LOS	
32	Taylor Rd/Del Oro High School North Lot	TWSC	19.5	C	20.5	C	1.0
33	Taylor Rd/Del Oro High School Drop-Off[1]	TWSC	**42.3**	**E**	**48.2**	**E**	5.9
34	Taylor Rd/Del Oro High School South Lot	TWSC	23.1	C	24.2	C	1.1
35	Taylor Rd/Rippey Road	TWSC	14.4	B	15.0	C	0.6
36	Taylor Rd/Webb Street	TWSC	**8006.9**	**F**	**ERR[3]**	**F**	-
37	Sierra College Boulevard/ Project Driveway East	TWSC	DNE		11.1	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.

TWSC: Two-way stop control - The delay reported reflects the critical movement.

DNE: Intersection does not exist under no Project conditions.

Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.

Shaded cell indicates significant Project impact

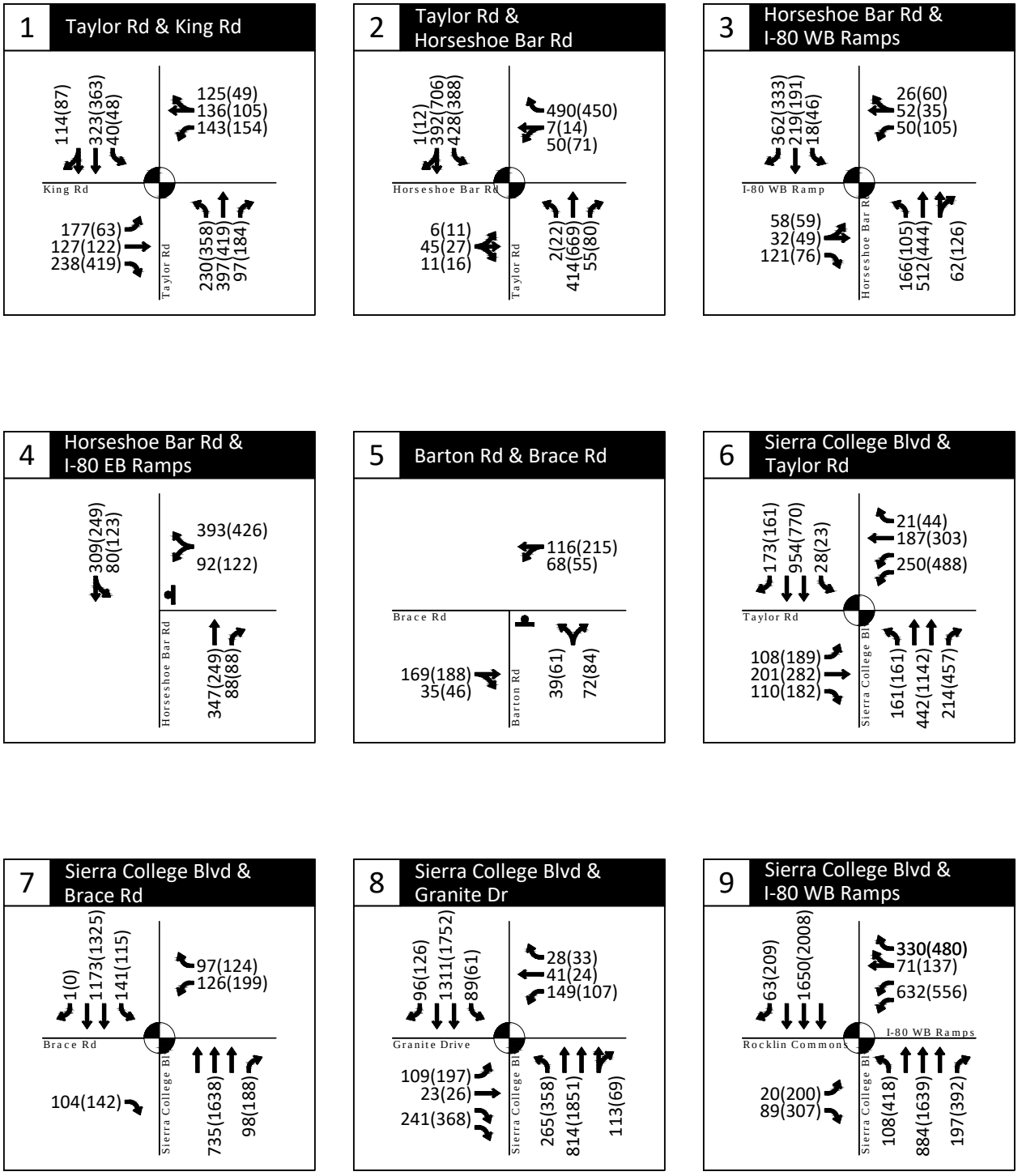
[1] An impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection. At these locations, the project does not contribute 5% or more of the volumes.

[2] Intersection does not meet signal warrants for impacts condition, therefore per the Placer County guidelines, this intersection is not significantly impacted. Traffic signal warrants provided in Appendix J.

[3] Due to the high volumes, HCM2010 was unable to report approach delay.

[4] Timing was held constant between No Project and Project conditions. Volume increases at certain movements adds more weight to the average intersection delay calculation, lowering the overall intersection delay

Source: Kittelson & Associates, Inc. 2019



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
22A

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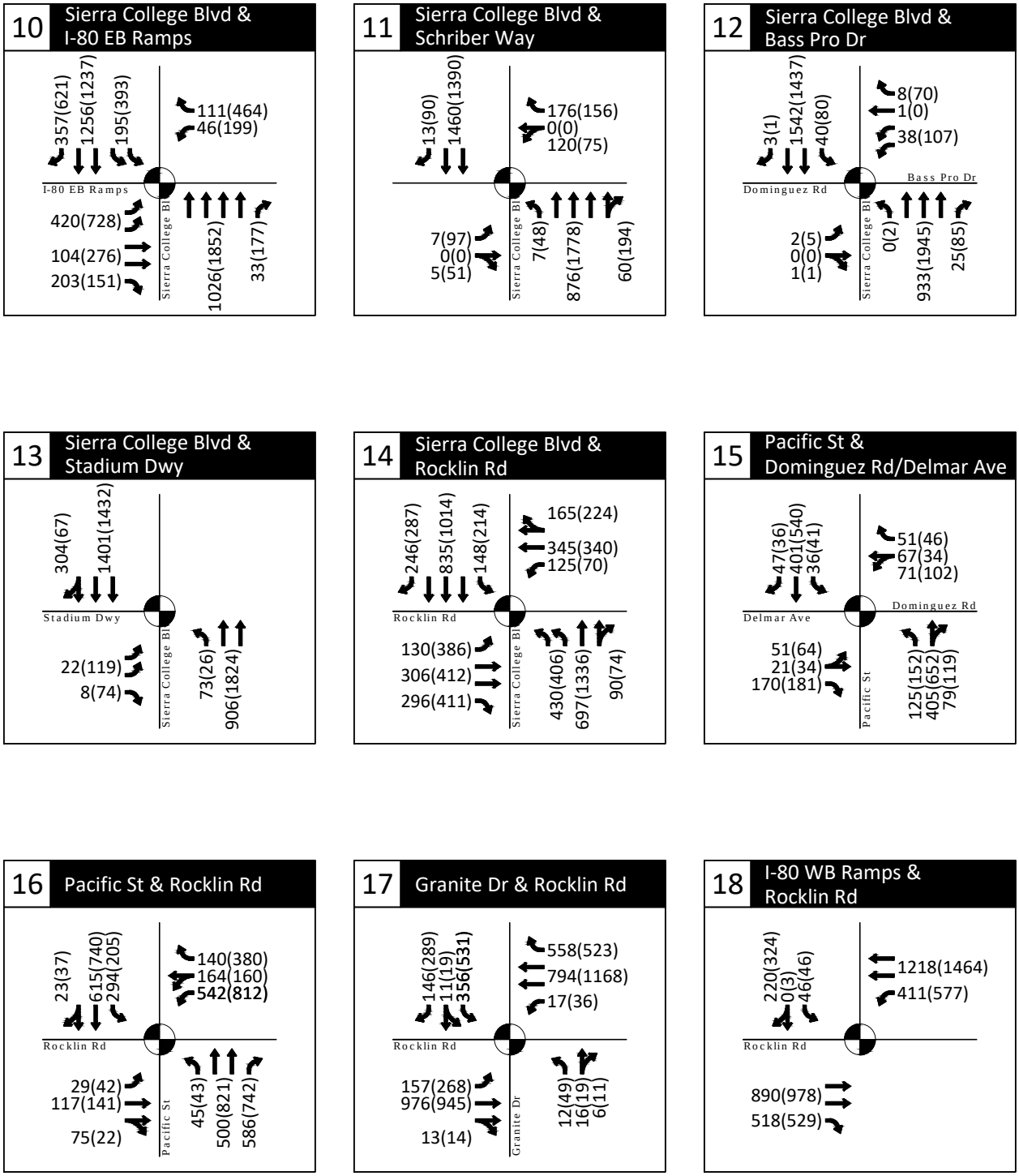
KITTELSON & ASSOCIATES



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
22B

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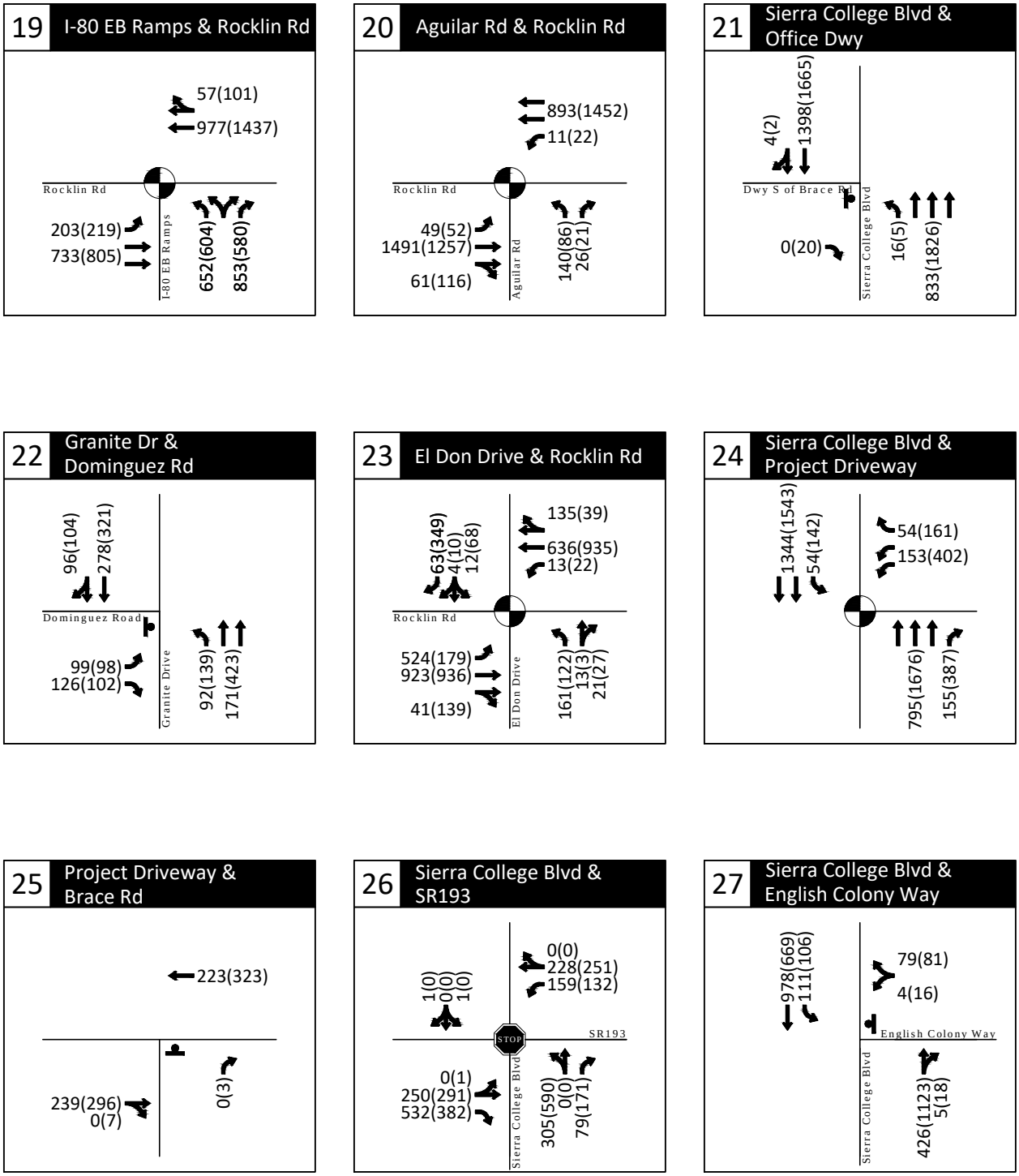


AM(PM) - Weekday Traffic Volume

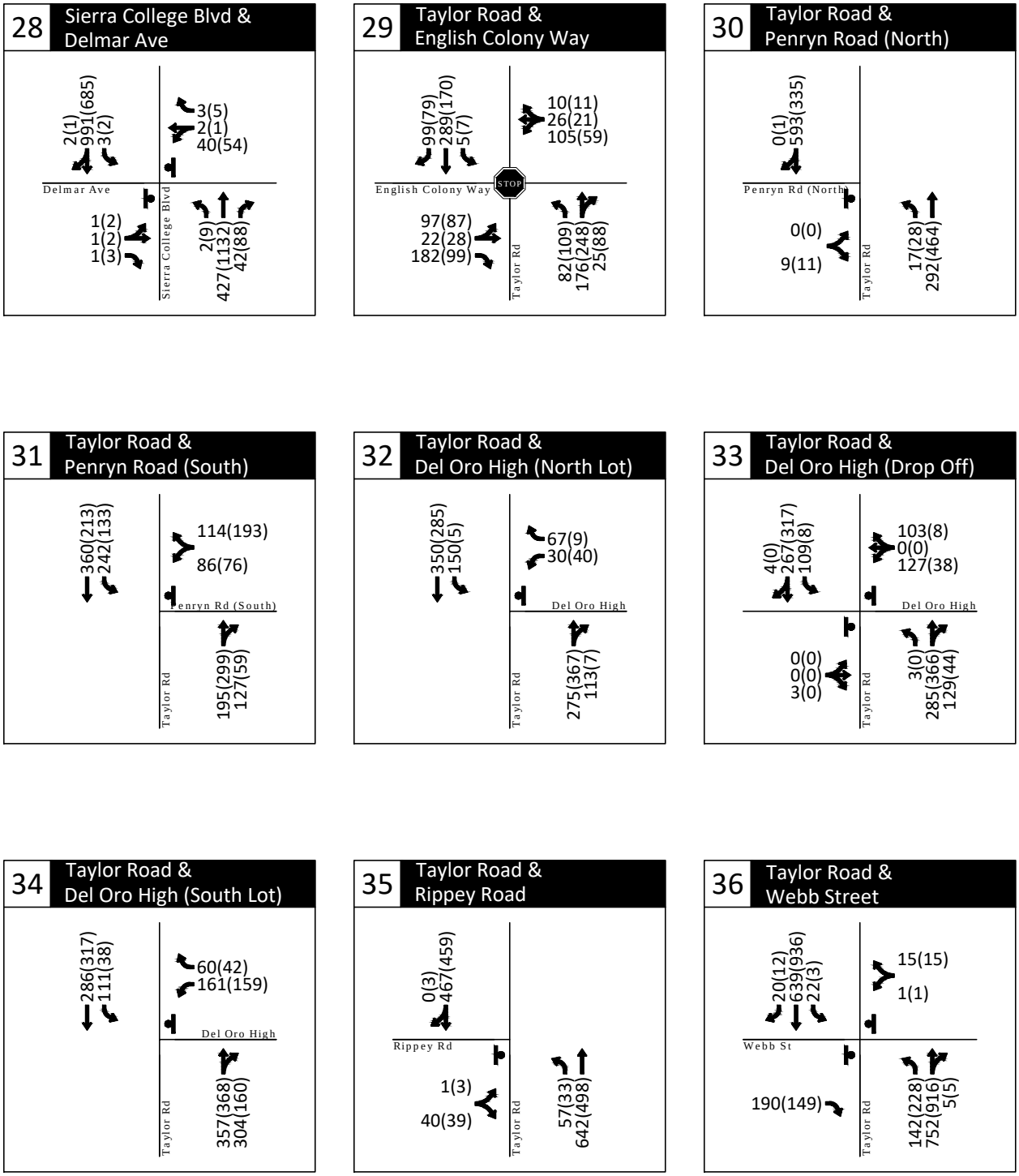
- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
22C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:23pm - aloveday Layout Tab: CumShP AM-PM C



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
22D

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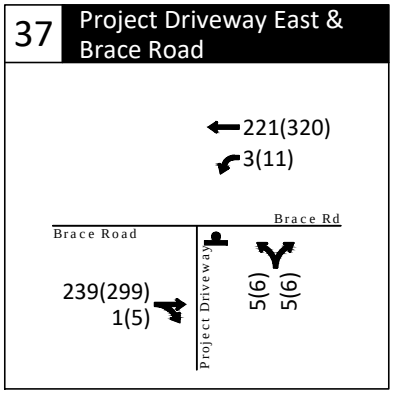

AM(PM) - Weekday Traffic Volume
- Stop Sign
- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
22E

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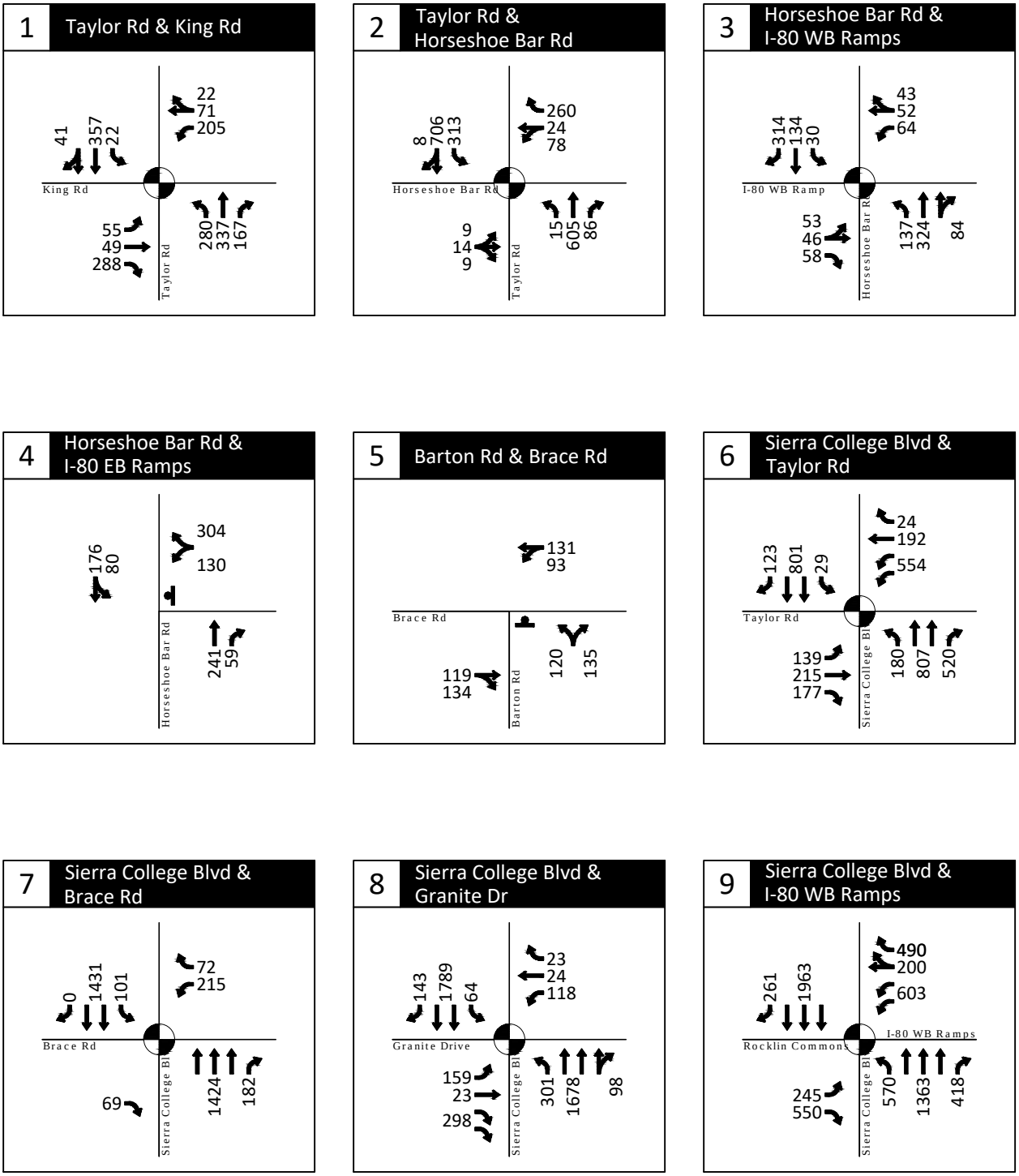

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
23A

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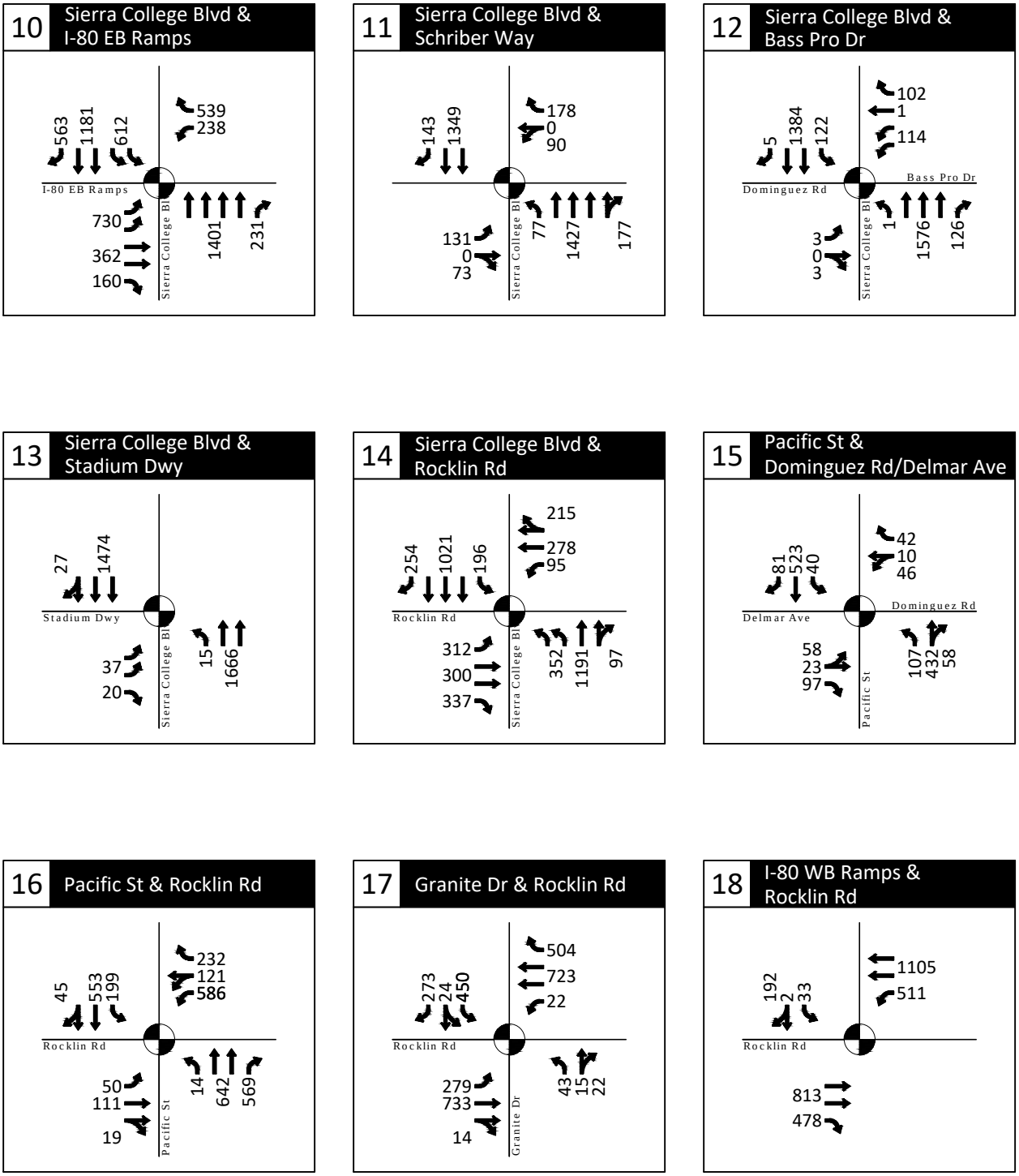

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions

Weekend Midday Peak Hour - Project Driveway Option 1A

Loomis, California

Figure 23B

KITTELSON & ASSOCIATES

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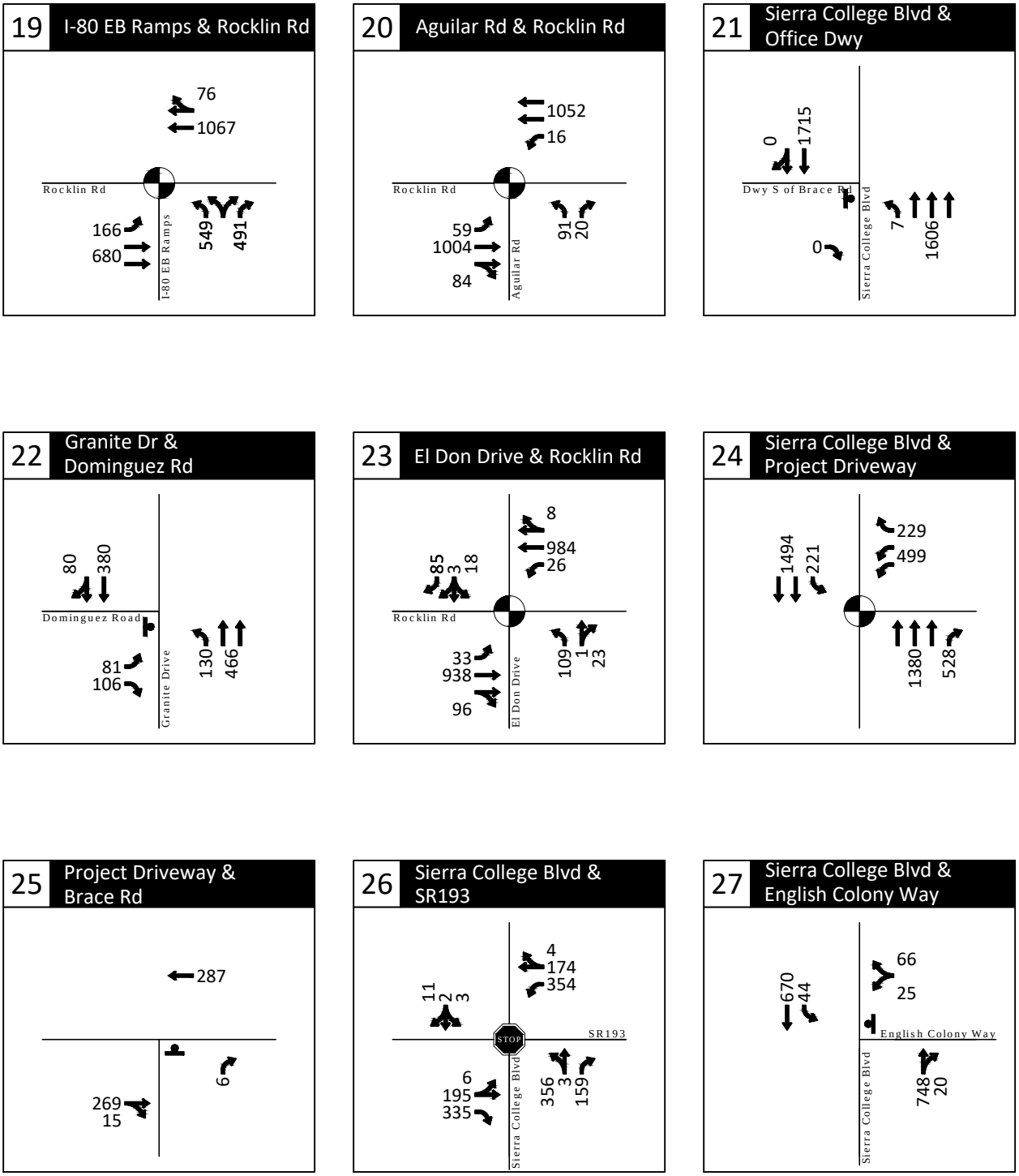

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
23C

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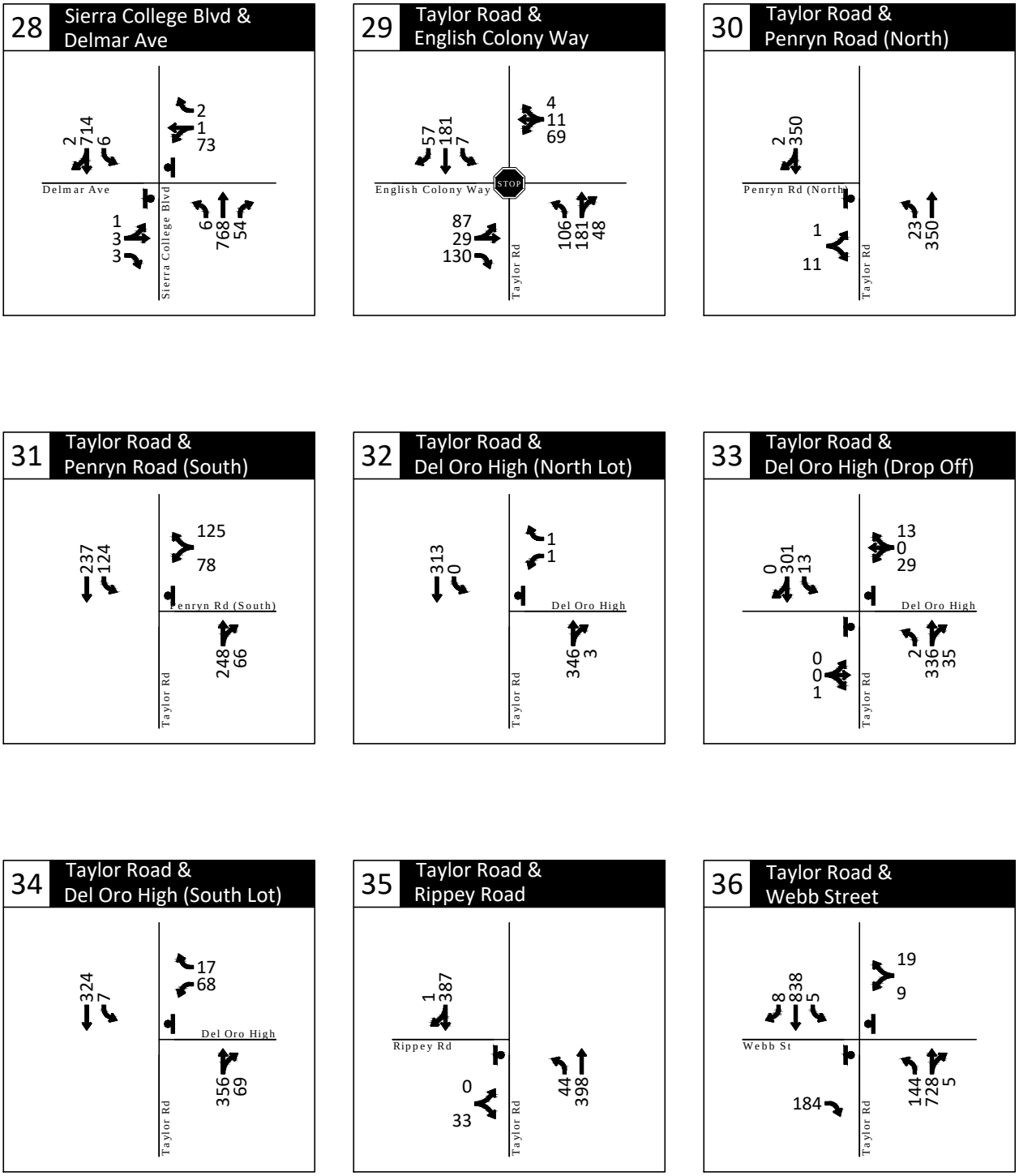

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
23D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:31pm - aloveday Layout Tab: CumShP SAT D

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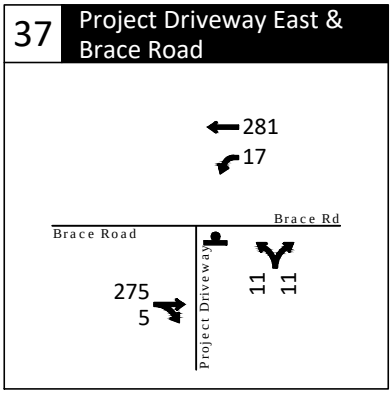

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
23E

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Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C would affect operations of study intersections 7, 8, 21, 24, 25, and 37 due to the driveway trip routing. All other study intersections would operate the same under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Alternative driveway configurations would affect operations at a limited number of study intersections. Table 36 shows the baseline Cumulative Short Term No-Project and Plus Project delays and LOS at those study intersections affected by the options during weekday AM and PM peak hours.

Table 37 shows the baseline Cumulative No-Project and Plus Project delays and LOS at those study intersections affected by the options during the weekend midday peak hour.

The following affected study area intersections would be significantly impacted by the proposed Project for Project Driveway Options 1B and 1C :

- Sierra College Boulevard & Granite Drive (PM and MD)

Table 36: Cumulative Short Term Plus Project - Intersection LOS Analysis, Weekday AM/PM Peak Hour – Project Driveway Options 1B & 1C

ID	Intersection	Traffic Control Type	Weekday AM					Weekday PM				
			Short Term		Plus Project		Change in Delay (sec)	Short Term		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS		Delay (sec)	LOS	Delay (sec)	LOS	
Driveway Option 1B												
7	Sierra College Blvd/Brace Rd	Signal	10.7	B	15.0	B	4.3	18.3	B	40.5	D	22.2
8	Sierra College Blvd/Granite Dr	Signal	**35.9**	**D**	**39.3**	**D**	3.4	**58.2**	**E**	**83.0**	**F**	24.8
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.2	A	0.2	A	0.0	17.6	C	18.3	C	0.7
24	Sierra College Blvd/Project Driveway	Signal	DNE		6.6	A	-	DNE		13.3	B	-
25	Brace Road/Project Driveway	TWSC	DNE		0.0	A	-	DNE		10.1	B	-
37	Brace Road/Project Driveway East	TWSC	DNE					DNE				
Driveway Option 1C												
7	Sierra College Blvd/Brace Rd	Signal	10.7	B	14.1	B	3.4	18.3	B	16.9	B	-1.4
8	Sierra College Blvd/Granite Dr	Signal	**35.9**	**D**	**39.3**	**D**	3.4	**58.2**	**E**	**83.0**	**F**	24.8
21	Sierra College Blvd/Dwy South of	TWSC	0.2	A	0.2	A	0.0	17.6	C	18.2	C	0.6
24	Sierra College Blvd/Project Driveway	Signal	DNE		6.6	A	-	DNE		13.1	B	-
25	Brace Road/Project Driveway	TWSC	DNE		0.0	A	-	DNE		10.1	B	-
37	Brace Road/Project Driveway East	TWSC	DNE		10.4	B	-	DNE		11.2	B	-

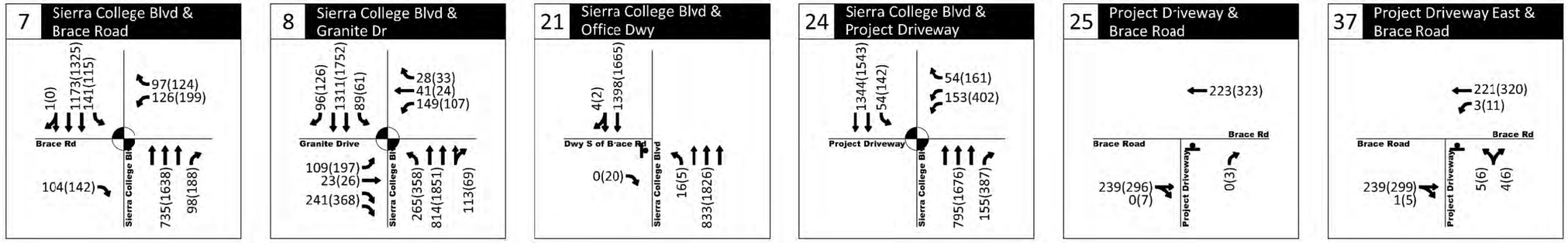
Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates significant Project impact
Source: Kittelson & Associates, Inc. 2019

Table 37: Cumulative Short Term Plus Project - Intersection LOS Analysis, Weekend Midday Peak Hour – Project Driveway Options 1B & 1C

ID	Intersection	Traffic Control Type	Short Term		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
Driveway Option 1B							
7	Sierra College Blvd/Brace Rd	Signal	15.1	B	31.1	C	16
8	Sierra College Blvd/Granite Dr	Signal	**39.9**	**D**	**60.1**	**E**	20.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
24	Sierra College Boulevard/Project Driveway	Signal	DNE		16.4	B	-
25	Brace Road/Project Driveway	TWSC	DNE		10.0	B	-
37	Brace Road/Project Driveway East	TWSC	DNE				
Driveway Option 1C							
7	Sierra College Blvd/Brace Rd	Signal	15.1	B	17.4	B	2.3
8	Sierra College Blvd/Granite Dr	Signal	**39.9**	**D**	**60.1**	**E**	20.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
24	Sierra College Boulevard/Project Driveway	Signal	DNE		15.7	B	-
25	Brace Road/Project Driveway	TWSC	DNE		9.9	A	-
37	Brace Road/Project Driveway East	TWSC	DNE		11.1	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates significant Project impact
Source: Kittelson & Associates, Inc. 2019

OPTION 1A



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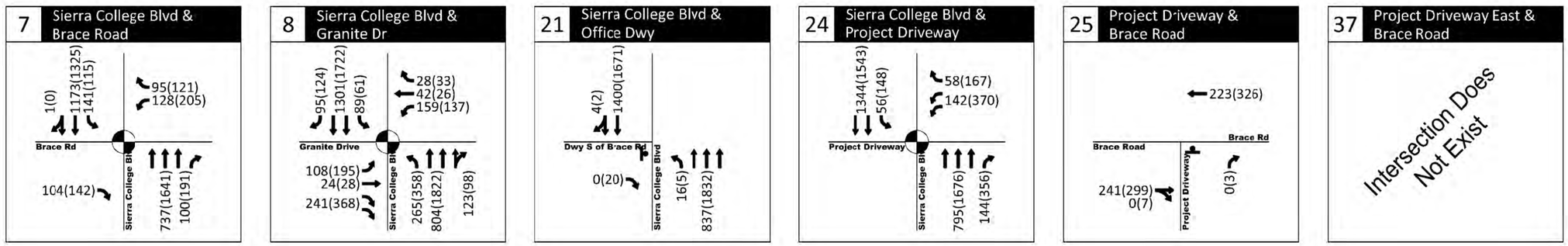

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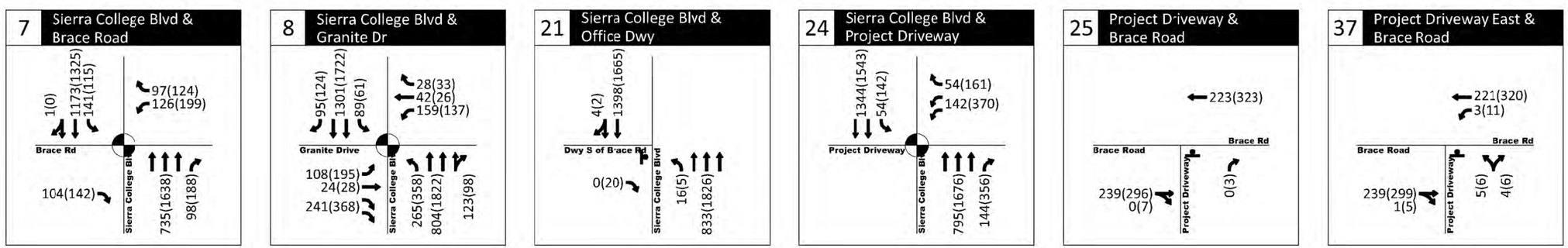

AM(PM) - Weekday Traffic Volume
- Stop Sign
- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Options 1B & 1C
Loomis, California

Figure 24

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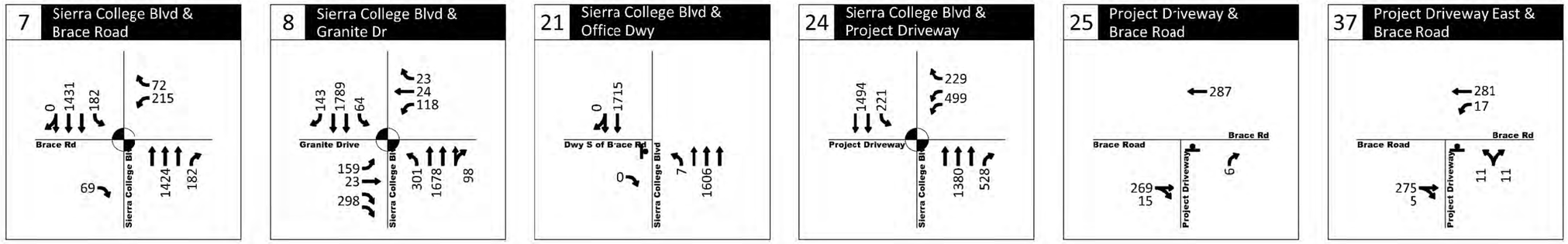
OPTION 1A



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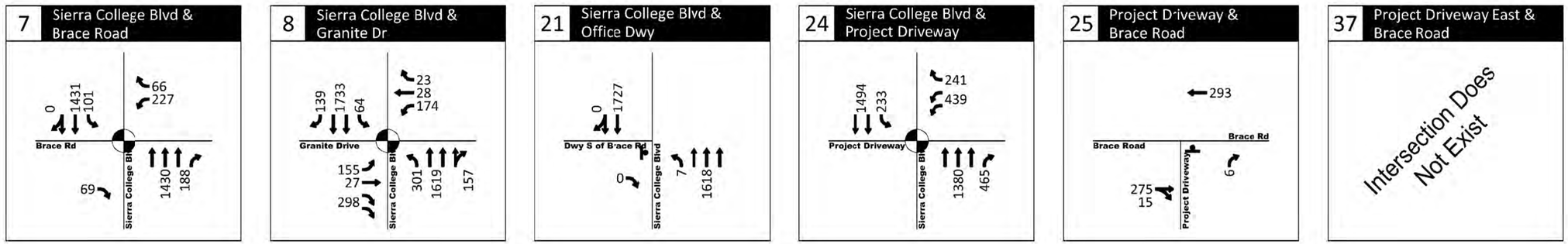

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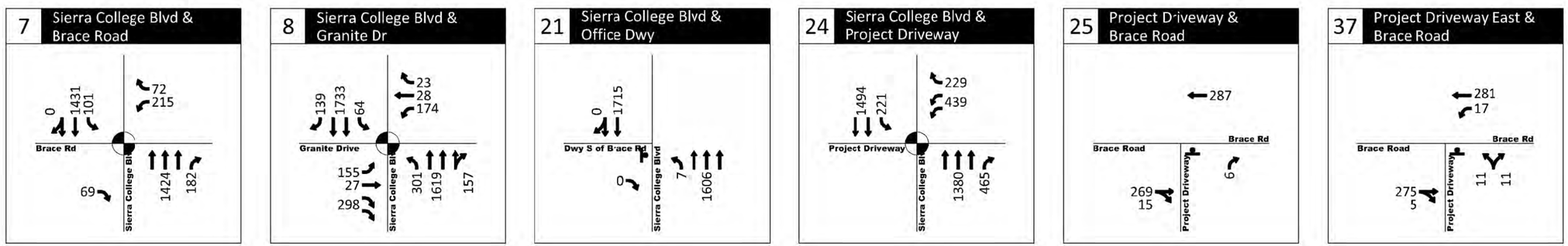

- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Cumulative Short Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Options 1B & 1C
Loomis, California

Figure 25

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8.1.2 Queuing Analysis

Appendix C provides the queue summary tables for the weekday AM, PM and weekend midday peak hours. Appendix "G" includes the Project contribution tables.

Project Driveway Option 1A

Forecast 95th percentile queues extend beyond the available storage lengths available for Project Driveway Option 1A at the following locations:

- Taylor Road & King Road (AM, PM, and MD)
- Taylor Road & Horseshoe Bar Road (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Westbound Ramp (AM, PM, and MD)
- Sierra College Boulevard & Taylor Road (AM, PM, and MD)
- Sierra College Boulevard & Brace Road (PM and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (AM, PM and MD)
- Sierra College Boulevard & I-80 EB Ramps (PM and MD)
- Sierra College Boulevard & Schriber Way (AM, PM, and MD)
- Sierra College Boulevard & Rocklin Road (AM, PM, and MD)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (PM and MD)
- I-80 Eastbound Ramps & Rocklin Road (AM, PM, and MD)
- Aguilar Road & Rocklin Road (AM)
- El Don Drive & Rocklin Road (AM)
- Sierra College Boulevard & Project Driveway (MD)
- Sierra College Boulevard & SR-193 (MD)
- Taylor Road & English Colony Way (AM and MD)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The northbound left-turn at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- The northbound through at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (AM, PM and MD)
- The southbound through at Sierra College Boulevard & Schriber Way would affect operations at Sierra College Boulevard & I-80 EB Ramps (AM, PM, and MD)
- The westbound left at I-80 Westbound Ramps & Rocklin Road would affect operations at I-80 Eastbound Ramps & Rocklin Road (PM)
- The westbound through at I-80 Eastbound Ramps & Rocklin Road would affect operations at Aguilar Road & Rocklin Road (AM and PM)
- The eastbound through at Aguilar Road & Rocklin Road would affect operations at I-80 Eastbound Ramps & Rocklin Road (AM)

Based on the intersection queuing significant impact criteria presented in Section 2 (Project traffic causes queue overflow or if queues overflows under no Project, the Project contributes 5% of the total traffic for the movement), an intersection queue significant impact occurs at the following intersections:

- Taylor Road & Horseshoe Bar Road (MD)
- Sierra College Boulevard & Taylor Road (PM and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (AM, PM, and MD)
- Granite Drive & Rocklin Road (MD)
- Sierra College Boulevard & Project Driveway (MD)
- Sierra College Boulevard & SR-193 (MD)

Please note that the queues at some study intersections may be lower when compared to existing conditions due to signal timing optimization and/or recirculation of traffic due to the addition of approved/pending projects.

Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C would affect operations of study intersections 7, 8, 21, 24, 25, and 37 due to driveway trip routing. All other study intersections would operate the same under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. One or more 95th percentile queues would extend beyond the available storage lengths at the following intersections (for those intersections affected by the driveway options):

- Sierra College Boulevard & Brace Road (PM and MD)[14]
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The northbound left-turn at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- The northbound through at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM and MD)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (AM, PM and MD)

Based on the intersection queuing significant impact criteria presented in Section 2 (Project traffic causes queue overflow or if queues overflows under no Project, the Project contributes 5% of the total traffic for the movement), an intersection queue significant impact occurs at the following affected study area intersections:

- Sierra College Boulevard & Brace Road (PM and MD)[14]
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)

[14] Weekday PM and Weekend Midday peak hour significantly impacted for Project Driveway Option 1B only.

8.2 PLACER COUNTY ROADWAY OPERATIONS

Analysis for the study segments was conducted using the LOS criteria defined as noted in Section 3.1. The three Project driveway options do not affect the Project traffic volumes for the roadway segments analyzed. Table 38 outlines the Cumulative Short Term with and without Project roadway volumes and associated level of service for the study segments and is applicable for all three Project driveway options. As shown, all study segments continue to satisfy the LOS C or better standard with the addition of Project trips regardless of the Project driveway option considered. Therefore, Project impacts would be less than significant.

Table 38: Cumulative Short Term plus Project Conditions – Placer County Weekday ADT Roadway Segment LOS Analysis

Roadway	Segment	Number of Lanes	Short Term		Short Term plus Project		
			ADT	LOS	Project ADT	ADT	LOS
Sierra College Boulevard (SCB)	SR-193 to English Colony Way	2	9,040	A	180	9,220	A
	English Colony Way to Delmar Ave	2	12,130	B	200	12,330	B
	Delmar Ave to Loomis Town Limits	2	12,130	B	220	12,350	B
SR-193	Lincoln City Limits to SCB	2	11,300	B	90	11,390	B
	SCB to Clark Tunnel Road	2	7,850	A	50	7,900	A

Notes:
ADT volumes sourced from Bickford Ranch Specific Plan EIR Addendum (October 2015) and adjusted based on City of Rocklin Travel Demand Model Growth Rates.
Source: Kittelson & Associates, Inc. 2019

8.3 FREEWAY FACILITIES EVALUATION

Cumulative Short Term Conditions traffic volumes for the weekday AM and PM peak hours were added to the site-generated traffic to arrive at the Short Term plus Project total traffic volumes.

8.3.1 Freeway Mainline Basic Segment Analysis

The three Project driveway options do not affect the Project traffic volumes for the freeway segments analyzed. Table 45 through Table 41 outline the Cumulative Short Term and Cumulative Short Term plus Project mainline volume, density and associated level of service for the study segments and are applicable for all three Project driveway options. As shown, all study segments operate at acceptable LOS D or better with Project traffic regardless of the Project driveway options considered. Therefore, no significant impacts occur to the freeway mainline under the Cumulative Short Term plus Project Conditions.

Appendix “E” includes the freeway mainline level-of-service worksheets.

Table 39: Cumulative Short Term – I-80 Mainline LOS Analysis, Weekday AM Peak Hour

ID	Segment	Direction	Short Term			Short Term plus Project			Change in Density
			Volume	Density	LOS	Volume	Density	LOS	
1	I-80 east of Sierra College	Eastbound	3,288	20.1	C	3,310	20.2	C	0.1
		Westbound	4,134	26.0	C	4,157	26.1	D	0.1
2	I-80 west of Sierra College	Eastbound	3,216	19.7	C	3,223	19.7	C	0.0
		Westbound	3,923	24.4	C	3,930	24.5	C	0.1

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

Table 40: Cumulative Short Term – I-80 Mainline LOS Analysis, Weekday PM Peak Hour

ID	Segment	Direction	Short Term			Short Term plus Project			Change in Density
			Volume	Density	LOS	Volume	Delay	LOS	
1	I-80 east of Sierra College	Eastbound	4,564	29.0	D	4,635	29.6	D	0.6
		Westbound	4,068	25.5	C	4,135	26.0	C	0.5
2	I-80 west of Sierra College	Eastbound	4,419	27.8	D	4,338	27.9	D	0.1
		Westbound	4,016	25.1	C	4,036	25.2	C	0.1

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

Table 41: Cumulative Short Term – I-80 Mainline LOS Analysis, Weekend MD Peak Hour

ID	Segment	Direction	Short Term			Short Term plus Project			Change in Density
			Volume	Density	LOS	Volume	Density	LOS	
1	I-80 east of Sierra College	Eastbound	4,187	23.8	C	4,317	24.6	C	0.8
		Westbound	4,243	23.6	C	4,380	24.4	C	0.8
2	I-80 west of Sierra College	Eastbound	4,392	25.1	C	4,431	25.3	C	0.2
		Westbound	4,198	23.3	C	4,236	23.5	C	0.2

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

8.3.2 Ramp Metering Supplemental Evaluation

The evalaution was prepared for informational purposes. The three Project driveway options do not affect the Project traffic volumes for the freeway ramps analyzed. Table 42 outlines the calculated freeway on-ramp queues under Cumulative Short Term and Cumulative Short Term plus Project conditions and is applicable for all three Project driveway options. As shown in Table 42, the calculated queues with the minimum metering rate are projected to be accommodated within the available 1,200-foot long storage area for all Project driveway options considered.

Appendix "I" includes the ramp metering worksheets.

Table 42: Cumulative Short Term Plus Project – I-80 Westbound Slip-Ramp Ramp Meter Analysis

Peak Hour	Short Term		Short Term plus Project	
	Meter Rate (vehicles/hour)	Calculated Queue (feet)	Meter Rate (vehicles/hour)	Calculated Queue (feet)
AM	240	11	240	55
PM	300	134	240	316
MD	300	0	300	86

Notes:
Boldface type indicates if queue exceeds available ramp storage capacity of 1,200 feet.
Source: Kittelson & Associates, Inc. 2019

8.4 PEDESTRIAN AND BICYCLE EVALUATION

The proposed Project would provide pedestrian facilities on-site linking with public facilities along the site frontages on Sierra College Boulevard and Brace Road to provide connectivity with existing facilities. Pedestrian crosswalks would be provided at proposed new signalized Costco site access intersection on Sierra College Boulevard. The project would reconstruct the Type II bicycle facility on Sierra College Boulevard northbound along the site frontage, including providing separate northbound right-turn lanes at the proposed signalized Project access and at Brace Road. In addition, the Project would provide bicycle parking on site for both members and employees.

Due to the nature of products and services provided by the Project, the Project would minimally increase pedestrian and bicycle traffic in the study area. Sidewalk connections would be provided along the Project site frontage with the proposed development along Sierra College Boulevard. The Project site would not be in conflict with applicable Town pedestrian and bicycle plans for any of the Project driveway options considered. The Project would have a less than significant impact on pedestrian and bicycle facilities.

8.5 TRANSIT EVALUATION

Due to the nature of products and services provided by the Project and limited transit connectivity provided adjacent to the site, the Project would minimally increase transit ridership in the study area. The nearest stop is approximately 0.6 mile from the Project site for routes with one hour and two hour headways. Due to the distance to the stop, relatively long headways, and employee shift times, it is unlikely that a significant number of employee trips would be added to the transit network. The project site would not be in conflict with applicable Placer County Transit plans or encroach on any lines or stops. The Project would have a less than significant impact on transit services and a new transit stop is not warranted at the Project site.

Project impacts on traffic flow could affect travel time for transit vehicles. Traffic flow impacts are addressed in the intersection evaluation sections of this study for all Project driveway options considered.

Section 9
Cumulative Conditions – Long Term

9.0 CUMULATIVE CONDITIONS – LONG TERM BASELINE

The Cumulative Long Term baseline traffic conditions analysis forecasts how the study area's transportation system would operate with the traffic generated by overall background and development growth in the area.

Cumulative Long Term conditions were based on a modified model using the City of Rocklin 2030 Travel Demand Model as a base. Both the Town and City models were reviewed and both models were incomplete in accounting for projects and improvements in either jurisdiction. With consultation with Town and City staff, the City's model was selected and modified as needed to account for anticipated development within the Town, City, and County. The model is developed and maintained by the City of Rocklin and is used to predict the impact of travel growth and to evaluate potential transportation improvements. The model was updated to account for approved/pending projects not included in the model as well as missing roadways and roadway improvements in the Town of Loomis. The model volumes were post-processed using standard industry procedures in order to obtain intersection and link-level traffic volumes used in this analysis.

Existing lane configurations were assumed for future conditions unless a funded project was identified for future baseline conditions. The following roadway improvements were assumed under Cumulative Long Term conditions:

- Sierra College Boulevard: widened to 5-6 lanes from Taylor Road to south of Rocklin Road (includes assumed southbound frontage improvements along the currently vacant commercial property west of Sierra College Boulevard between Granite Drive and Brace Road and only 2 northbound lanes between Granite Drive and Brace Road)
- Sierra College Boulevard & Highway 193 intersection signalization
- Sierra College Boulevard & English Colony Way intersection signalization
- Sierra College Boulevard & Delmar Avenue intersection signalization
- Taylor Road & Penryn Road intersection signalization
- Taylor Road & English Colony Way intersection signalization
- Pacific Street: widened to 4 lanes from Town of Loomis boundary line to Delmar Avenue/Dominguez Road
- Rocklin Road: widened to 6 lanes from east of Granite Drive (not improved at Granite Drive) to west of Sierra College Boulevard; widened to 4 lanes east of Sierra College Boulevard
- Dominguez Road extension from Granite Drive to Sierra College Boulevard: 2 lanes provided (including signalization of the Granite Drive & Dominguez Road intersection)

Based on discussions with the Town, the forecast year of 2035 was identified for the Cumulative Long Term condition which is consistent with the Town's General Plan Circulation Element. Therefore, growth

from the modified City of Rocklin 2030 model was forecast to year 2035 conditions. Link volumes for the calibration year of 2011 were compared with the analysis year of 2035 to obtain the growth factors for each intersection and freeway segment. The existing volumes for each facility were then multiplied by the growth factors to arrive at the future baseline condition volumes.

Future intersection post-processing procedures are predicated on existing counts and link volumes from the model. The baseline year for the model was 2011 and the future forecast year was 2030. Link volumes were interpolated using a straight-line growth between 2011 and 2030 to determine link volumes for the analysis year 2035. The Ratio Method was the primary forecasting methodology[15]. The resultant AM and PM peak-hour growth factors were applied to respective base year peak-hour traffic volumes to produce future turning movement volumes for analysis. In the situations where the resultant future-to-base-year ratio exceeds 2.0, the Difference Method[16] was applied. The difference between the base year and forecast year were added to the existing link volumes.

The future analysis year intersection turning movement volumes were developed following the post processing procedure (iterative method) documented in the National Cooperative Highway Research Program (NCHRP) Report 765: Highway Traffic Data for Urbanized Area Project Planning and Design (the most recent update of NCHRP Report 255). The post processed turning movements were rounded to the nearest five, recognizing the resultant data points are not field measured. Further adjustments were made to intersection locations where the baseline volumes may not have shown data and/or if a transportation analysis zone was not coded at specific intersections in the City of Rocklin 2030 model. For example, an approved development will provide the west approach at the Sierra College Boulevard and Schriber Way intersection that is not accounted for in the 2030 model. For this location, traffic volume data from the development traffic impact study was added to the intersection model volumes.

The City of Rocklin 2030 model does not forecast weekend conditions. Lacking weekend model data, weekend midday peak hour volumes were instead developed considering the relationship in growth between weekday AM and PM peak hour conditions. A comparison of ADT, AM and PM model growth projected on major corridors in the study area showed relatively consistent growth patterns. The PM peak hour growth was higher than AM peak hour and so was conservatively used as a basis to project weekend midday peak hour conditions. The base year and future year model data for each intersection approach was adjusted by the corresponding ratio of weekend midday volume to weekday PM volume. The data was post-processed using weekend midday turning movement volumes per the methodology described above. Final adjustments were made at intersections where model predicted negative growth occurred in projecting turning movement volumes.

[15] The Ratio Method computes the ratio of the base year and future year link volumes in the model to calculate separate growth factors for the entering and exiting volumes for each study intersection approach.

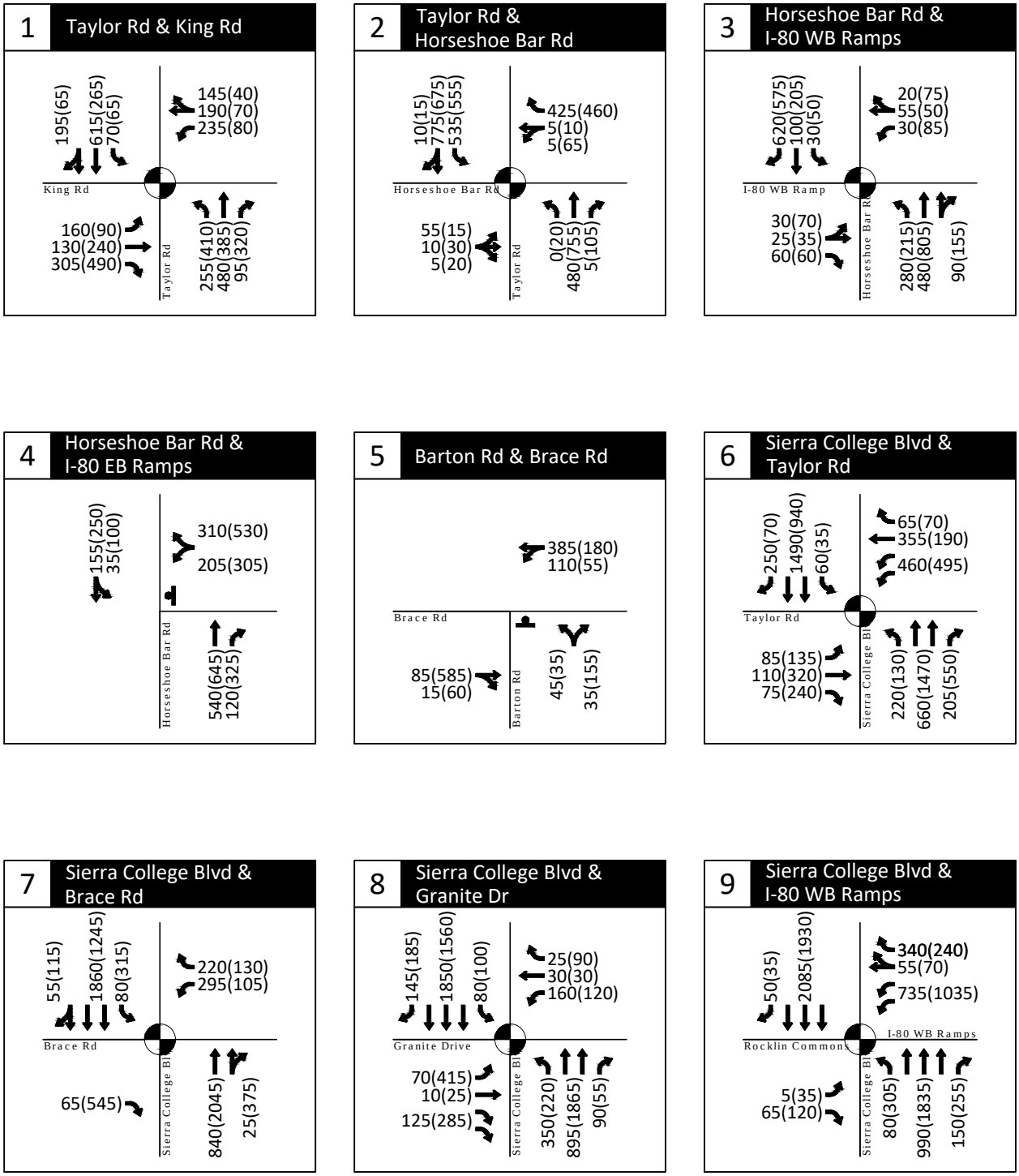
[16] The difference method adds (or subtracts) the difference between the base year traffic count and base year modeled volume to the forecasted model volume.

9.1 INTERSECTION EVALUATION

Cumulative Long Term Baseline conditions were assessed using the projected weekday AM and PM as well as weekend midday peak hour volumes. Given the growth from existing conditions, the traffic signal timing at the study intersections was optimized for the Cumulative Long Term Baseline conditions. Figure 26 shows the Cumulative Long Term Baseline traffic volumes during the weekday AM and PM peak hours while Figure 27 shows the Cumulative Long Term Baseline traffic volumes during the weekend midday peak hour. Please note that these volumes are based on the model outputs and may be lower for some movements when compared to existing or cumulative short term conditions. Overall intersection volumes for future conditions are higher as compared to existing or cumulative short term conditions.

The following intersection improvement was assumed in conjunction with the individual approved development projects:

- Sierra College Boulevard & Schriber Way intersection signalized and western approach added by approved development project.



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
26A

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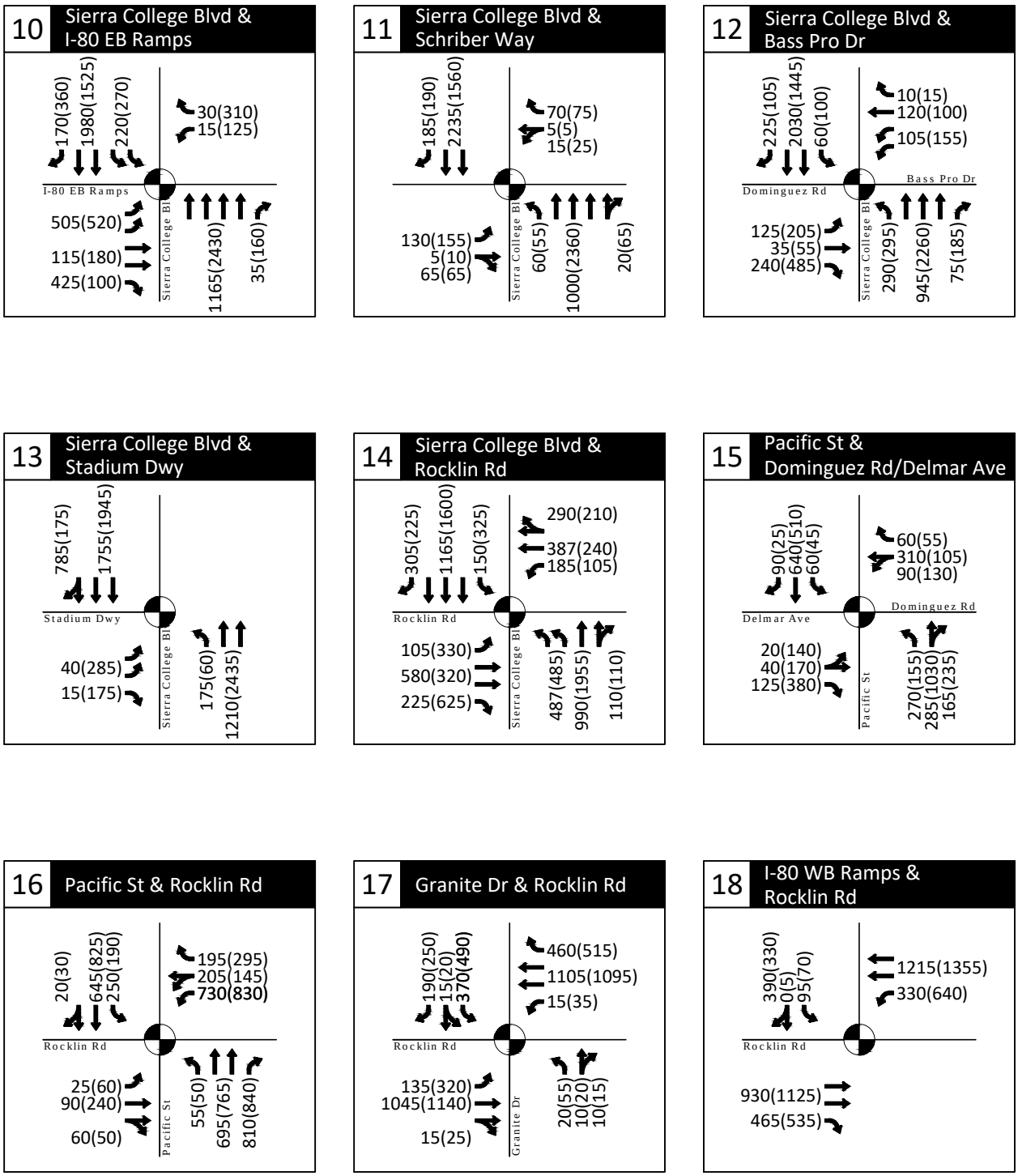


AM(PM) - Weekday Traffic Volume

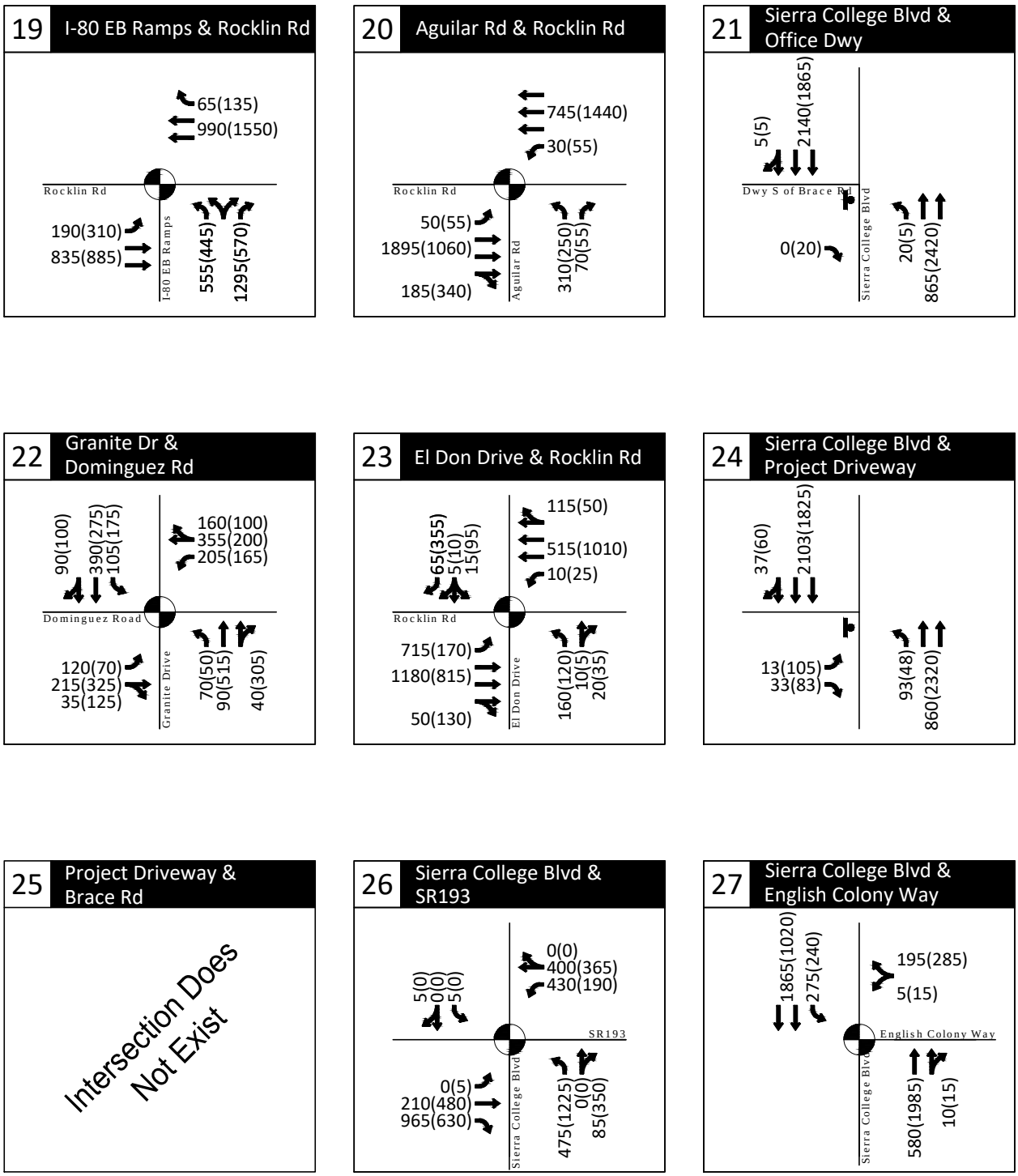
- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
26B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:34pm - aloveday Layout Tab: Cum AM_PM B



AM(PM) - Weekday Traffic Volume

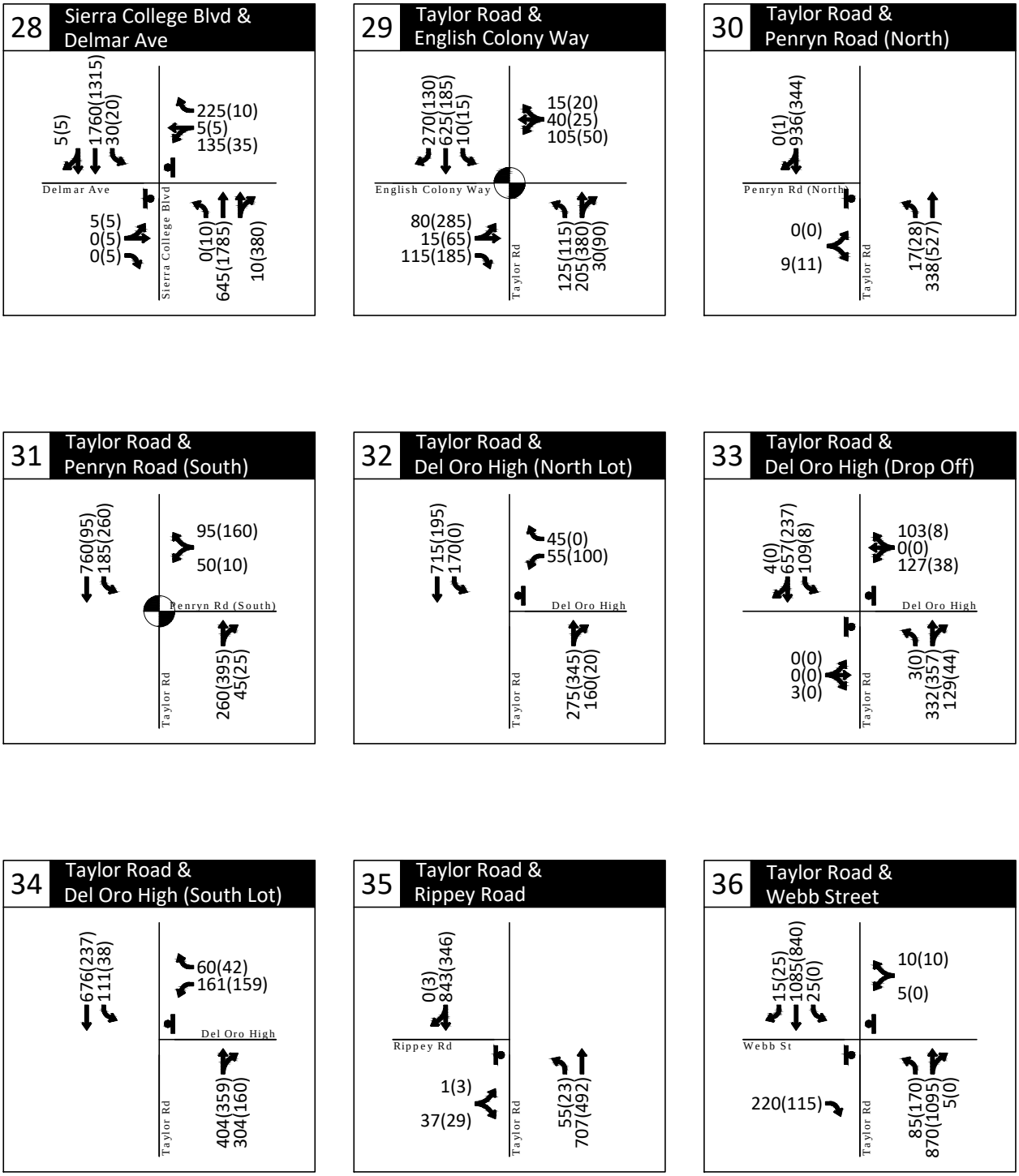
- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
26C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:34pm - aloveday Layout Tab: Cum AM_PM C



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
26D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:34pm - aloveday Layout Tab: Cum AM_PM D

37	Project Driveway East & Brace Road
Intersection Does Not Exist	

AM(PM) - Weekday Traffic Volume

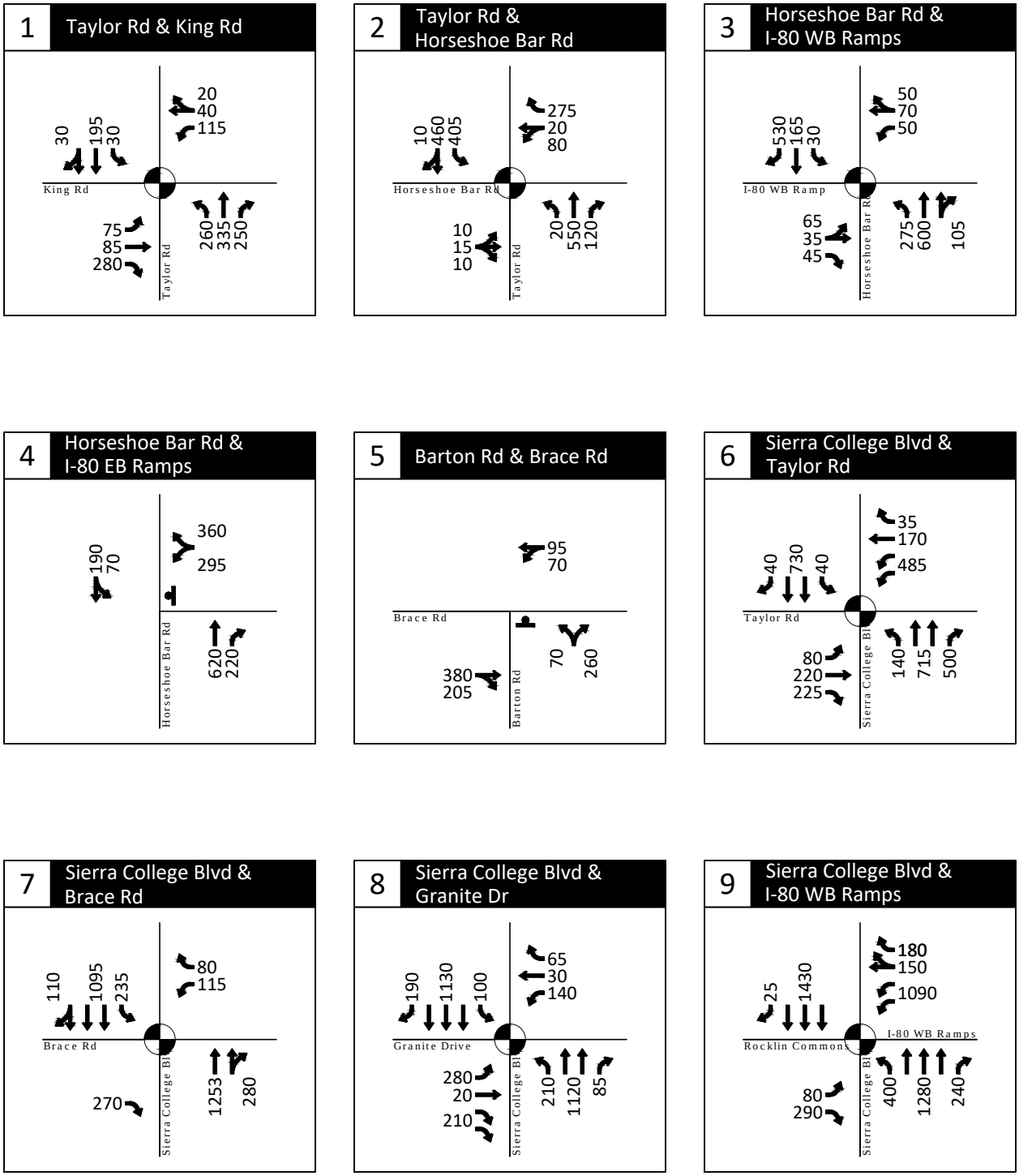
- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekday AM and PM Peak Hours
Loomis, California

Figure
26E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:35pm - aloveday Layout Tab: Cum AM_PM E



- Weekend Midday Traffic Volume

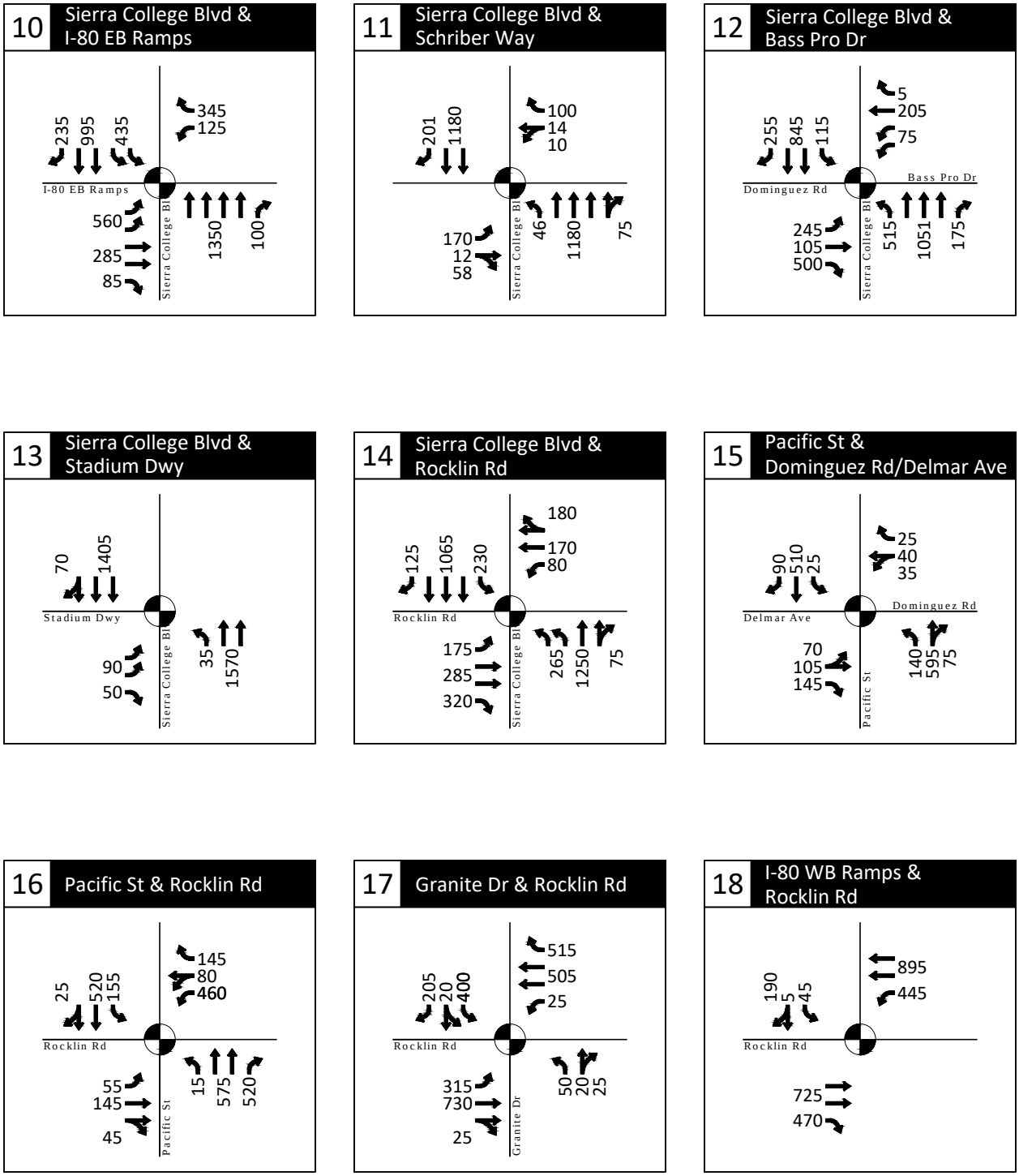
- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
27A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:35pm - aloveday Layout Tab: Cum SAT A



- Weekend Midday Traffic Volume

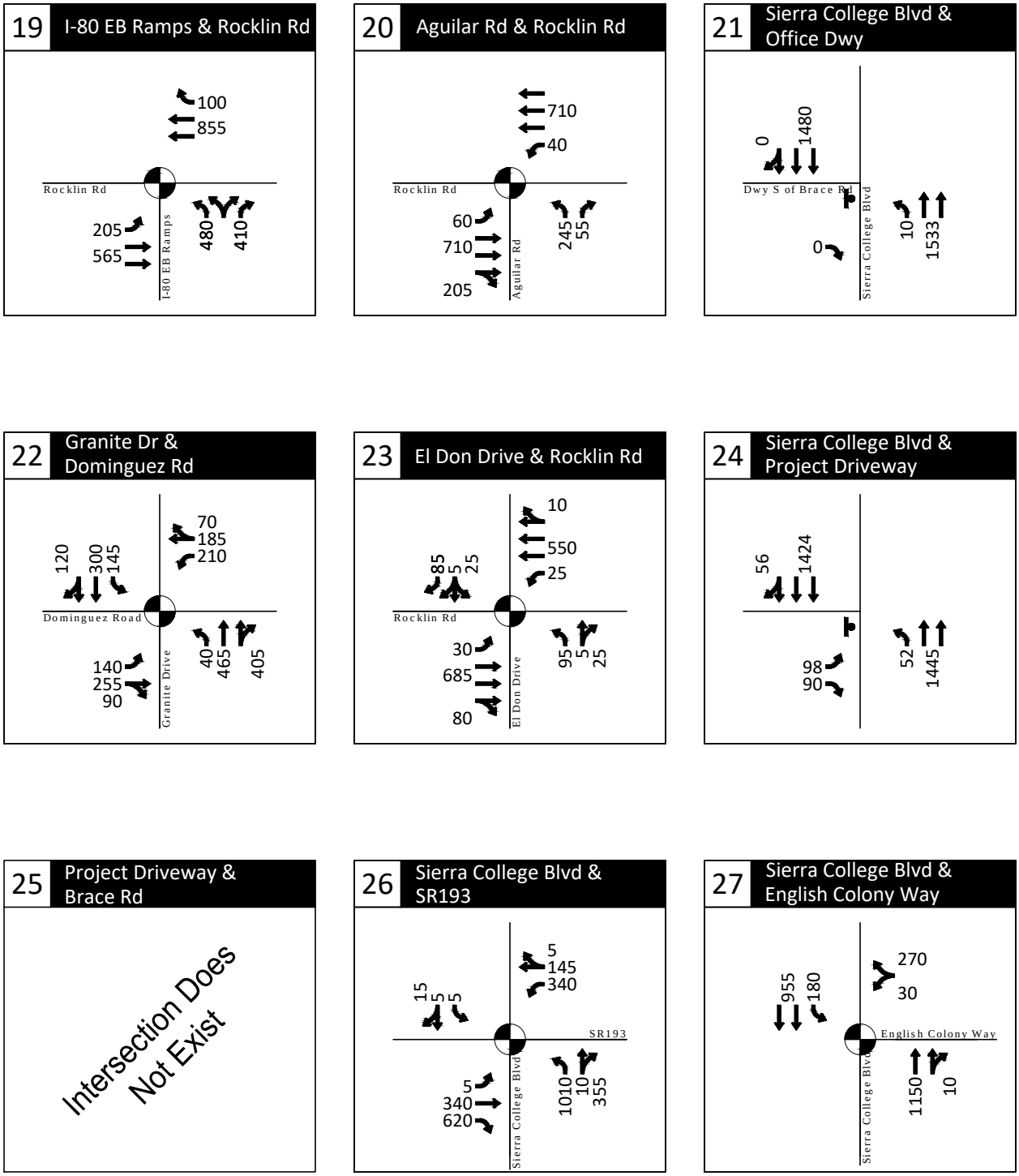
- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
27B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:35pm - aloveday Layout Tab: Cum SAT B



- Weekend Midday Traffic Volume

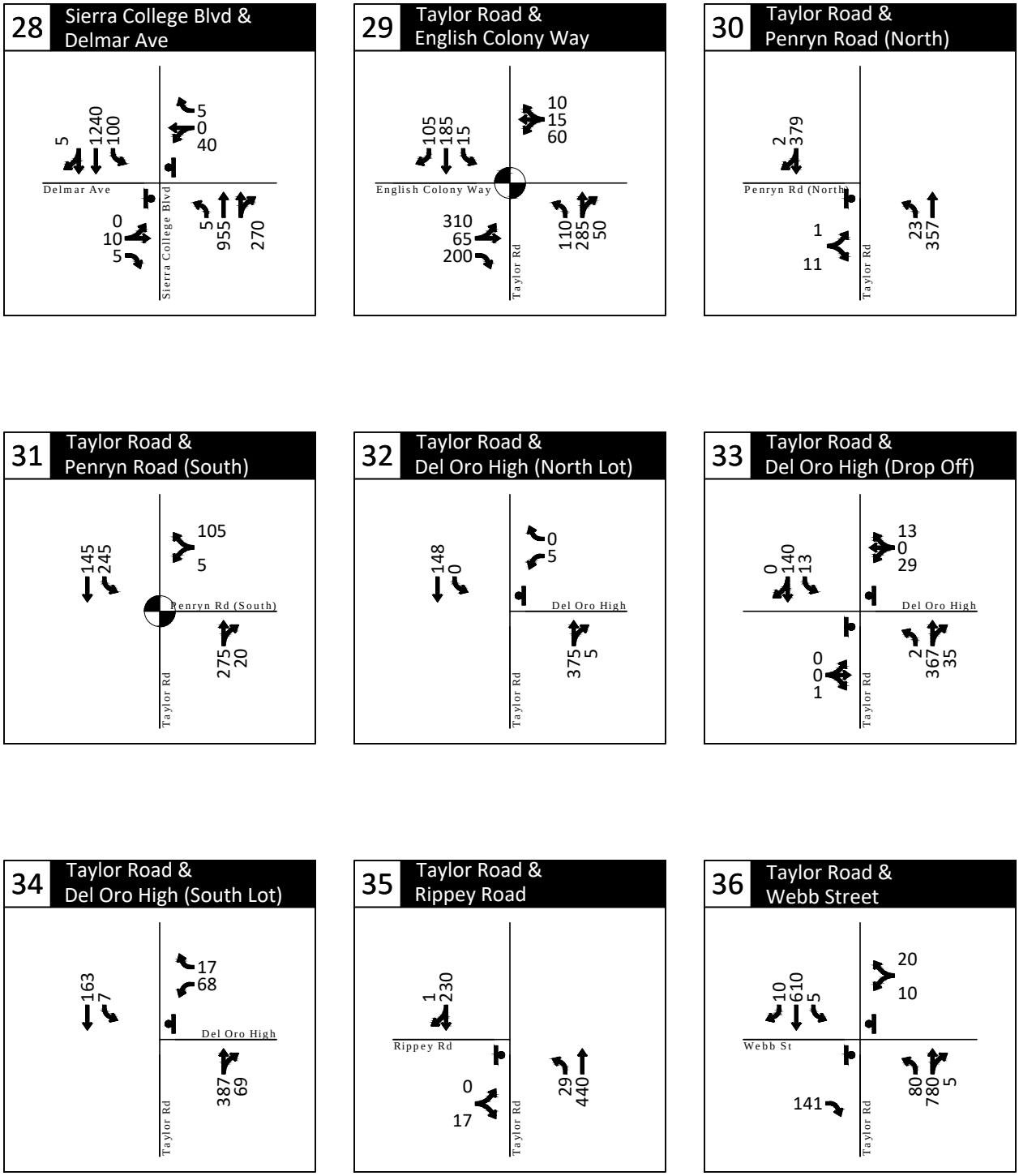
- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
27C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:36pm - aloveday Layout Tab: Cum SAT C



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
27D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:37pm - aloveday Layout Tab: Cum SAT D

37	Project Driveway East & Brace Road
Intersection Does Not Exist	

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Traffic Conditions
Weekend Midday Peak Hour
Loomis, California

Figure
27E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:37pm - aloveday Layout Tab: Cum SAT E

9.1.1 Level-of-Service Analysis

Table 43 summarizes the LOS analysis for the study intersections under Cumulative Long Term Baseline conditions. As shown, the following intersections operate at unacceptable LOS:

- Taylor Road & King Road (AM and PM)
- Horseshoe Bar Road & I-80 Eastbound Ramp (AM, PM, and MD)
- Barton Road & Brace Road (MD)
- Sierra College Boulevard & Taylor Road (AM and PM)
- Sierra College Boulevard & Brace Road (PM)
- Sierra College Boulevard & Granite Drive (AM and PM)
- Sierra College Boulevard & Schriber Way (AM)
- Sierra College Boulevard & Bass Pro Drive/Dominguez Road (AM, PM, and MD)
- Sierra College Boulevard & Rocklin Road (AM, PM and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (AM, PM, and MD)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (PM)
- I-80 Eastbound Ramps & Rocklin Road (AM)
- Granite Drive & Dominguez Road (AM, PM, and MD)
- El Don Drive & Rocklin Road (PM)
- Sierra College Boulevard & Project Driveway (not yet serving Project site development but assuming commercial development on the west side of Sierra College Boulevard) (AM, PM, and MD)
- Sierra College Boulevard & SR-193 (PM and MD)
- Sierra College Boulevard & English Colony Way (PM)
- Taylor Road & English Colony Way (AM and MD)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM and MD)
- Taylor Road & Del Oro High School South Lot (AM)
- Taylor Road & Rippey Road (AM)
- Taylor Road & Webb Street (AM and MD)

Appendix “B” includes the level-of-service worksheets.

Table 43: Cumulative Long Term Baseline Conditions - Intersection LOS Analysis, Weekday AM/PM and Weekend Midday Peak Hours

ID	Intersection	Traffic Control Type	Weekday AM		Weekday PM		Weekend MD	
			Delay	LOS	Delay	LOS	Delay	LOS
1	Taylor Rd/King Rd	Signal	**85.8**	**F**	**72.8**	**E**	29.5	C
2	Taylor Rd/Horseshoe Bar Rd	Signal	28.7	C	45.4	D	24.7	C
3	Horseshoe Bar Rd/I-80 Westbound Ramp	Signal	13.1	B	15.5	B	14.6	B
4	Horseshoe Bar Rd/I-80 Eastbound Ramp	TWSC	**213.9**	**F**	**978.6**	**F**	**621.0**	**F**
5	Barton Rd/Brace Rd	TWSC	15.8	C	23.6	C	**43.1**	**E**
6	Sierra College Blvd/Taylor Rd	Signal	**67.3**	**E**	**51.9**	**D**	33.2	C
7	Sierra College Blvd/Brace Rd	Signal	12.9	B	**137.4**	**F**	20.3	C
8	Sierra College Blvd/Granite Dr	Signal	**36.4**	**D**	**68.5**	**E**	28.3	C
9	Sierra College Blvd/I-80 WB Ramps	Signal	37.1	D	46.1	D	42.2	D
10	Sierra College Blvd/I-80 EB Ramps	Signal	39.7	D	48.6	D	36.4	D
11	Sierra College Blvd/Schriber Way	Signal	**37.6**	**D**	16.1	B	16.0	B
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	**122.3**	**F**	**102.4**	**F**	**74.0**	**E**
13	Sierra College Blvd/Stadium Dwy	Signal	26.7	C	19.3	B	7.4	A
14	Sierra College Blvd/Rocklin Rd	Signal	**66.1**	**E**	**172.8**	**F**	**50.9**	**D**
15	Pacific St/Dominguez Rd-Delmar Ave	Signal	**444.3**	**F**	**755.8**	**F**	**56.4**	**E**
16	Pacific St/Rocklin Rd	Signal	**129.7**	**F**	**104.9**	**F**	**35.3**	**D**
17	Granite Dr/Rocklin Rd	Signal	**37.1**	**D**	**43.9**	**D**	**35.3**	**D**
18	I-80 Westbound Ramps/Rocklin Rd	Signal	36.3	D	**57.7**	**E**	23.2	C
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	**66.3**	**E**	45.8	D	18.8	B
20	Aguilar Rd/Rocklin Rd	Signal	19.5	B	13.8	B	11.1	B
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	1.2	A	23.5	C	0.1	A
22	Granite Dr/Dominguez Rd	Signal	**36.7**	**D**	**54.4**	**D**	**73.9**	**E**
23	El Don Dr/Rocklin Rd	Signal	33.2	C	**59.6**	**E**	12.6	B
24	Sierra College Boulevard/Project Driveway	TWSC	**ERR[1]**	**F**	**6299.3**	**F**	**898.5**	**F**
26	Sierra College Blvd/SR-193	Signal	46.6	D	**133.1**	**F**	**186.1**	**F**
27	Sierra College Blvd/English Colony Way	Signal	15.8	B	**57.5**	**E**	18.9	B
28	Sierra College Blvd/Delmar Avenue	Signal	14.5	B	8.0	A	3.3	A
29	Taylor Rd/English Colony Way	Signal	**40.7**	**D**	30.1	C	**48.8**	**D**
30	Taylor Rd/Penryn Road (North)	TWSC	23.3	C	10.6	B	11.3	B
31	Taylor Rd/Penryn Road (South)	Signal	19.1	B	22.6	C	17.1	B
32	Taylor Rd/Del Oro High School North Lot	TWSC	**765.0**	**F**	14.7	B	20.7	C

ID	Intersection	Traffic Control Type	Weekday AM		Weekday PM		Weekend MD	
			Delay	LOS	Delay	LOS	Delay	LOS
33	Taylor Rd/Del Oro High School Drop-Off	TWSC	**1584.5**	**F**	15.8	C	**29.5**	**D**
34	Taylor Rd/Del Oro High School South Lot	TWSC	**187.1**	**F**	17.3	C	20.8	C
35	Taylor Rd/Rippey Road	TWSC	**25.9**	**D**	11.2	B	11.2	B
36	Taylor Rd/Webb Street	TWSC	**4103.8**	**F**	21.0	C	**435.6**	**F**

Notes:

AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards. Source: Kittelson & Associates, Inc. 2019

9.1.2 Queuing Analysis

Appendix C provides the queue summary tables for the weekday AM, PM and weekend midday peak hours. Forecast 95th percentile queues are projected to extend beyond the available storage lengths at the following intersections:

- Taylor Road & King Road (AM, PM, and MD)
- Taylor Road & Horseshoe Bar Road (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Westbound Ramp (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Eastbound Ramp (PM and MD)
- Sierra College Boulevard & Taylor Road (AM, PM, and MD)
- Sierra College Boulevard & Brace Road (AM, PM, and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (AM, PM, and MD)
- Sierra College Boulevard & I-80 EB Ramps (AM, PM, and MD)
- Sierra College Boulevard & Schriber Way (AM, PM, and MD)
- Sierra College Boulevard & Bass Pro Drive/Dominguez Road (AM, PM, and MD)
- Sierra College Boulevard & Stadium Dwy (AM and PM)
- Sierra College Boulevard & Rocklin Road (AM, PM, and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (AM and PM)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (AM, PM, and MD)
- I-80 Eastbound Ramps & Rocklin Road (AM and PM)
- Aguilar Road & Rocklin Road (AM)

- Granite Drive & Dominguez Road (AM, PM, and MD)
- El Don Drive & Rocklin Road (AM)
- Sierra College Boulevard & Project Driveway (AM, PM, and MD)
- Sierra College Boulevard & SR-193 (AM, PM, and MD)
- Sierra College Boulevard & English Colony Way (AM, PM, and MD)
- Taylor Road & English Colony Way (AM, PM, and MD)
- Taylor Road & Penryn Road (south) (AM, PM, and MD)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The westbound through at Horseshoe Bar Road & I-80 Eastbound Ramp would back up to the I-80 Eastbound mainline (PM and MD)
- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The southbound left-turn at Sierra College Boulevard & Brace Road would affect operations at Sierra College Boulevard & Taylor Road (PM)
- The northbound left-turn at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (AM)
- The northbound through at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM)
- The southbound through at Sierra College Boulevard & I-80 Westbound Ramps would affect operations at Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- The southbound through at Sierra College Boulevard & Schriber Way would affect operations at Sierra College Boulevard & I-80 EB Ramps (AM and PM)
- The southbound through at Sierra College Boulevard & Bass Pro Drive/Dominguez Road would affect operations at Sierra College Boulevard & Schriber Way (AM and PM)
- The westbound left-turn at I-80 Westbound Ramps & Rocklin Road would affect operations at I-80 Eastbound Ramps & Rocklin Road (PM)
- The westbound through at I-80 Eastbound Ramps & Rocklin Road would affect operations at Aguilar Road & Rocklin Road (PM)

9.1.3 Supplemental Simulation Evaluation

The Cumulative Long Term Conditions simulation evaluation was conducted with the same assumptions as outlined in Section 4.0 for Existing Conditions and is provided for informational purposes only. The total network performance results of the simulation runs are presented in Table 44 and the arterial performance results are presented in Table 45.

As shown, under Cumulative Long Term Conditions the network is projected to experience congestion that contributes to increased delays as well as an increased number of vehicles being denied entry into the network.

For the Sierra College Boulevard corridor, delay and travel time increase by almost double those under Existing Conditions. In addition, the average arterial speed drops below 16 miles per hour.

Table 44: Cumulative Long Term Conditions – Simulation Total Network Performance Results

Peak Hour	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry
AM	173.9	9,765	9,377	1,099
PM	198.6	11,954	11,718	2,258
MD	106.2	11,316	11,208	625

Notes:
(s): seconds
Total Delay/Vehicle: Total delay is equal to the travel time minus the travel time for a vehicle with no other vehicles or control devices. This delay is divided by the number of vehicles to obtain the total delay per vehicle.
Vehicles Entered/Exited: Represents the number of vehicles counted entering and exiting the link or area during the interval. This value does not include vehicles moving from one intersection to the next with the arterial or network.
Vehicles Denied Entry: This value represents the number of vehicles unable to enter a link due to congestion and are waiting to enter. These vehicles can either be from an external link or from a mid-block source.
Source: Kittelson & Associates, Inc. 2019

Table 45: Cumulative Long Term Conditions – Simulation Sierra College Boulevard Arterial Performance Results

Segment	Peak Hour	Direction	Delay (s)	Travel Time (s)	Arterial Speed (mph)
Sierra College Boulevard between Taylor Road and Stadium Way	AM	Northbound	291.2	417.2	13
		Southbound	468.0	1,361.8	11
	PM	Northbound	471.5	1,611.8	9
		Southbound	419.7	776.8	11
	MD	Northbound	246.4	662.3	15
		Southbound	273.9	447.5	16

Notes:
Total Delay: Total Delay for the average vehicle traveling the length of the corridor including stopped delay and congestion delay.
Total Travel Time: Time in seconds for the average vehicle to travel the length of the corridor.
Average Arterial Speed: Average speed of the average vehicle traveling the length of the corridor.
Source: Kittelson & Associates, Inc. 2019

The detailed network and arterial performance output sheets are presented in Appendix "D".

9.2 PLACER COUNTY ROADWAY OPERATIONS

Analysis for the study segments was conducted using the LOS criteria defined as noted in Section 3.1. Table 46 outlines the Cumulative Long Term roadway volume and associated level of service for the study segments. As shown, with baseline volume increases the study segments satisfy the LOS C or better standard with the exception of Sierra College Boulevard between English Colony Way to the Loomis Town Limits.

Table 46: Cumulative Long Term Conditions – Placer County Weekday ADT Roadway Segment LOS Analysis

Roadway	Segment	Number of Lanes	ADT	LOS
Sierra College Boulevard (SCB)	SR-193 to English Colony Way	4	20,150	A
	English Colony Way to Delmar Ave	4	31,360	D
	Delmar Ave to Loomis Town Limits	4	29,920	D
SR-193	Lincoln City Limits to SCB	4	26,530	C
	SCB to Clark Tunnel Road	2	11,880	B

Notes:
ADT volumes sourced from Bickford Ranch Specific Plan EIR Addendum (October 2015) and adjusted based on City of Rocklin Travel Demand Model Growth Rates.
Source: Kittelson & Associates, Inc. 2019

9.3 FREEWAY FACILITIES EVALUATION

Freeway mainline future forecast volumes were calculated following the same intersection data projection methodology.

9.3.1 Freeway Mainline Basic Segment Analysis

Table 47 outlines the Cumulative Long Term mainline volume, density and associated level of service for the study segments. As shown, operations of two study segments exceed acceptable LOS D:

- I-80 east of Sierra College Boulevard – Westbound (PM)
- I-80 west of Sierra College Boulevard – Westbound (PM)

Appendix “E” includes the freeway mainline level-of-service worksheets.

Table 47: Cumulative Long Term Baseline Conditions – I-80 Mainline LOS Analysis, Weekday AM/PM Peak Hours

ID	Segment	Direction	Weekday AM			Weekday PM			Weekend MD		
			Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS
1	I-80 east of Sierra College Boulevard	Eastbound	4,780	30.9	D	5,060	30.9	D	5,340	324	D
		Westbound	4,700	30.7	D	5,440	35.8	E	5,030	28.9	D
2	I-80 west of Sierra College Boulevard	Eastbound	5,000	33.0	D	4,440	26.1	D	5,350	32.5	D
		Westbound	4,290	27.1	D	5,550	37.1	E	5,050	29.0	D

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

9.3.2 Ramp Metering Supplemental Evaluation

The evalaution was prepared for informational purposes. Table 48 shows that the calculated queues with the assumed minimum metering rate generate can be accommodated within the 1,200 feet of available storage area.

Appendix "I" includes the ramp metering worksheets.

Table 48: Cumulative Long Term Baseline Conditions – I-80 Westbound Slip-Ramp Ramp Meter Analysis

Peak Hour	Meter Rate (vehicles/hour)	Calculated Queue (feet)
AM	240	0
PM	450	473
MD	450	134

Notes:
Boldface type indicates if queue exceeds available ramp storage capacity of 1,200 feet.
Source: Kittelson & Associates, Inc. 2019

9.4 PEDESTRIAN AND BICYCLE EVALUATION

No pedestrian or bicycle facility improvements were programmed under Cumulative Long Term Conditions.

9.5 TRANSIT EVALUATION

No transit service improvements were programmed under Cumulative Long Term Conditions. The impact of approved in-process and other non-Project future development on traffic flow could affect travel time for transit vehicles. Traffic flow effects due to approved in-process and other non-Project future development are addressed in the intersection evaluation sections of this study.

Section 10 Cumulative Conditions – Long Term plus Project

10.0 CUMULATIVE CONDITIONS – LONG TERM PLUS PROJECT

The Cumulative Long Term plus Project traffic conditions analysis forecasts how the study area's transportation system would operate with the traffic generated by the proposed Costco warehouse development.

10.1 INTERSECTION EVALUATION

Cumulative Long Term Baseline Conditions traffic volumes for the weekday AM and PM as well as weekend midday peak hours were added to the site-generated traffic to arrive at the Cumulative Long Term plus Project volumes.

Figure 28 shows the Cumulative Long Term plus Project (Project Driveway Option 1A) traffic condition during the weekday AM and PM peak hours and Figure 29 shows the Cumulative Long Term plus Project (Project Driveway Option 1A) traffic condition during the weekend midday peak hour. Project Driveway Options 1B and 1C would affect Cumulative Short Term plus Project traffic volumes at study intersections 7, 8, 21, 24, 25, and 37 due to the driveway routing. All other study intersections would have the same Cumulative Short Term plus Project traffic volumes under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. For Project Driveway Option 1A, Figure 30 shows the Cumulative Long Term plus Project traffic condition during the weekday AM and PM peak hours for all three Project driveway options at those study intersections affected by the options. Figure 31 shows the Cumulative Long Term plus Project Alternative traffic condition during the weekend midday peak hour for all three Project driveway options at those study intersections affected by the options.

10.1.1 Level-of-Service Analysis

To gauge the impact of the Project traffic on the baseline roadway network, the Project analysis assumed that study intersection signal timings would be unchanged from those under no Project conditions except at study locations where the Project provides roadway improvements (specifically, Sierra College Boulevard & Granite Drive as well as Sierra College Boulevard & Brace Road).

Project Driveway Option 1A

Table 49 shows the baseline Cumulative Long Term No-Project and Plus Project (Project Driveway Option 1A) delays and LOS for the study intersections during weekday AM and PM peak hours. Table 50 shows the baseline Cumulative Long Term No-Project and Plus Project (Project Driveway Option 1A) delays and LOS for the study intersections during weekend midday peak hour.

As shown in the tables below, the following intersections would operate at unacceptable LOS:

- Taylor Road & King Road (AM and PM)
- Horseshoe Bar Road & I-80 Eastbound Ramp (AM, PM, and MD)
- Barton Road & Brace Road (MD)
- Sierra College Boulevard & Taylor Road (AM, PM, and MD)
- Sierra College Boulevard & Brace Road (PM)
- Sierra College Boulevard & Granite Drive (AM and PM)
- Sierra College Boulevard & Schriber Way (AM)
- Sierra College Boulevard & Bass Pro Drive/Dominguez Road (AM, PM, and MD)
- Sierra College Boulevard & Rocklin Road (AM, PM and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (AM, PM, and MD)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (PM)
- I-80 Eastbound Ramps & Rocklin Road (AM)
- Granite Drive & Dominguez Road (AM, PM, and MD)
- El Don Drive & Rocklin Road (PM)
- Sierra College Boulevard & SR-193 (PM and MD)
- Sierra College Boulevard & English Colony Way (PM)
- Taylor Road & English Colony Way (AM and MD)
- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM and MD)
- Taylor Road & Del Oro High School South Lot (AM)
- Taylor Road & Rippey Road (AM)
- Taylor Road & Webb Street (AM and MD)

Based on the impact criteria defined earlier, the following intersections would be significantly impacted by the proposed Project:

- Sierra College Boulevard & Taylor Road (MD)
- Sierra College Boulevard & Granite Drive (PM)
- Sierra College Boulevard & Bass Pro Drive/Dominguez Road (MD)
- Sierra College Boulevard & SR-193 (MD)
- Taylor Road & Webb Street (MD)

Appendix “B” includes the level-of-service worksheets.

Table 49: Cumulative Conditions – Long Term Traffic Conditions, Weekday AM and PM Peak – Project Driveway Option 1A

ID	Intersection	Traffic Control Type	Weekday AM				Change in Delay (sec)	Weekday PM				Change in Delay (sec)
			Long Term		LT Plus Project			Long Term		LT Plus Project		
			Delay (Sec)	LOS	Delay (Sec)	LOS		Delay (Sec)	LOS	Delay (Sec)	LOS	
1	Taylor Rd/King Rd	Signal	**85.8**	**F**	**86.6**	**F**	0.8	**72.8**	**E**	**75.6**	**E**	2.8
2	Taylor Rd/Horseshoe Bar Rd	Signal	28.7	C	29.4	C	0.7	45.4	D	47.7	D	2.3
3	Horseshoe Bar Rd/ I-80 Westbound Ramp	Signal	13.1	B	13.1	B	0.0	15.5	B	15.5	B	0.0
4	Horseshoe Bar Rd/ I-80 Eastbound Ramp[1]	TWSC	**213.9**	**F**	**213.9**	**F**	0.0	**978.6**	**F**	**978.6**	**F**	0.0
5	Barton Rd/Brace Rd	TWSC	15.8	C	16.0	C	0.2	23.6	C	24.4	C	0.8
6	Sierra College Blvd/Taylor Rd	Signal	**67.3**	**E**	**69.0**	**E**	1.7	**51.9**	**D**	**55.9**	**E**	4.0
7	Sierra College Blvd/Brace Rd	Signal	12.9	B	17.1	B	4.2	**137.4**	**F**	**76.5**	**F**	-60.9
8	Sierra College Blvd/Granite Dr	Signal	**36.4**	**D**	**37.6**	**D**	1.2	**68.5**	**E**	**118.0**	**F**	49.5
9	Sierra College Blvd/ I-80 WB Ramps	Signal	37.1	D	37.4	D	0.3	46.1	D	70.0	E	23.9
10	Sierra College Blvd/ I-80 EB Ramps	Signal	39.7	D	47.5	D	7.8	48.6	D	52.0	D	3.4
11	Sierra College Blvd/ Schriber Way	Signal	**37.6**	**D**	**38.6**	**D**	1.0	16.1	B	16.2	B	0.1
12	Sierra College Blvd/ Bass Pro Dr-Dominguez Rd	Signal	**122.3**	**F**	**123.4**	**F**	1.1	**102.4**	**F**	**106.9**	**F**	4.5
13	Sierra College Blvd/ Stadium Dwy	Signal	26.7	C	27.1	C	0.4	19.3	B	20.5	C	1.2
14	Sierra College Blvd/Rocklin Rd	Signal	**66.1**	**E**	**66.7**	**E**	0.6	**172.8**	**F**	**175.7**	**F**	2.9
15	Pacific St/ Dominguez Rd-Delmar Ave	Signal	**444.3**	**F**	**445.7**	**F**	1.4	**755.8**	**F**	**751.2**	**F**	-4.6
16	Pacific St/Rocklin Rd	Signal	**129.7**	**F**	**129.9**	**F**	0.2	**104.9**	**F**	**105.9**	**F**	1.0
17	Granite Dr/Rocklin Rd	Signal	**37.1**	**D**	**37.7**	**D**	0.6	**43.9**	**D**	**45.7**	**D**	1.8
18	I-80 WB Ramps/Rocklin Rd	Signal	36.3	D	36.3	D	0.0	**57.7**	**E**	**57.7**	**E**	0.0
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	**66.3**	**E**	**66.3**	**E**	0.0	45.8	D	45.8	D	0.0
20	Aguilar Rd/Rocklin Rd	Signal	19.5	B	19.6	B	0.1	13.8	B	13.8	B	0.0
21	Sierra College Blvd/ Dwy South of Brace Rd	TWSC	1.2	A	1.2	A	0.0	23.5	C	24.5	C	1.1
22	Granite Dr/Dominguez Rd	Signal	**36.7**	**D**	**36.7**	**D**	0.0	**54.4**	**D**	**55.3**	**E**	0.9
23	El Don Dr/Rocklin Rd	Signal	33.2	C	33.3	C	0.1	**59.6**	**E**	**59.6**	**E**	0.0
24	Sierra College Boulevard/ Project Driveway	Signal	**ERR[3]**	**F**	17.7	B	-	**6299.3**	**F**	31.7	C	-6197.6
25	Brace Road/Project Driveway	TWSC	DNE		0.0	A	-	DNE		13.9	B	-

ID	Intersection	Traffic Control Type	Weekday AM				Change in Delay (sec)	Weekday PM				Change in Delay (sec)
			Long Term		LT Plus Project			Long Term		LT Plus Project		
			Delay (Sec)	LOS	Delay (Sec)	LOS		Delay (Sec)	LOS	Delay (Sec)	LOS	
26	Sierra College Blvd/SR-193	Signal	46.6	D	47.1	D	0.5	**133.1**	**F**	**135.5**	**F**	2.4
27	Sierra College Blvd/ English Colony Way	Signal	15.8	B	16.0	B	0.2	**57.5**	**E**	**59.0**	**E**	1.5
28	Sierra College Blvd/ Delmar Avenue	Signal	14.5	B	14.6	B	0.1	8.0	A	8.6	A	0.6
29	Taylor Rd/English Colony Way	Signal	**40.7**	**D**	**41.1**	**D**	0.4	30.1	C	30.2	C	0.1
30	Taylor Rd/Penryn Road (North)	TWSC	23.3	C	23.4	C	0.1	10.6	B	10.7	B	0.1
31	Taylor Rd/Penryn Road (South)	Signal	19.1	B	19.2	B	0.1	22.6	C	22.8	C	0.2
32	Taylor Rd/ Del Oro High School North Lot[1]	TWSC	**765.0**	**F**	**765.0**	**F**	0.0	14.7	B	15.0	C	0.3
33	Taylor Rd/ Del Oro High School Drop-Off[1]	TWSC	**1584.5**	**F**	**1610.3**	**F**	25.8	15.8	C	16.1	C	0.3
34	Taylor Rd/ Del Oro High School South Lot[1]	TWSC	**187.1**	**F**	**187.2**	**F**	0.1	17.3	C	17.6	C	0.3
35	Taylor Rd/ Rippey Road	TWSC	**25.9**	**D**	**26.2**	**D**	0.3	11.2	B	11.3	B	0.1
36	Taylor Rd/ Webb Street	TWSC	**4103.8**	**F**	**4103.8**	**F**	0.0	21.0	C	21.9	C	0.9
37	Brace Road/Project Driveway East	TWSC	DNE		10.9	B	-	DNE		14.6	B	-

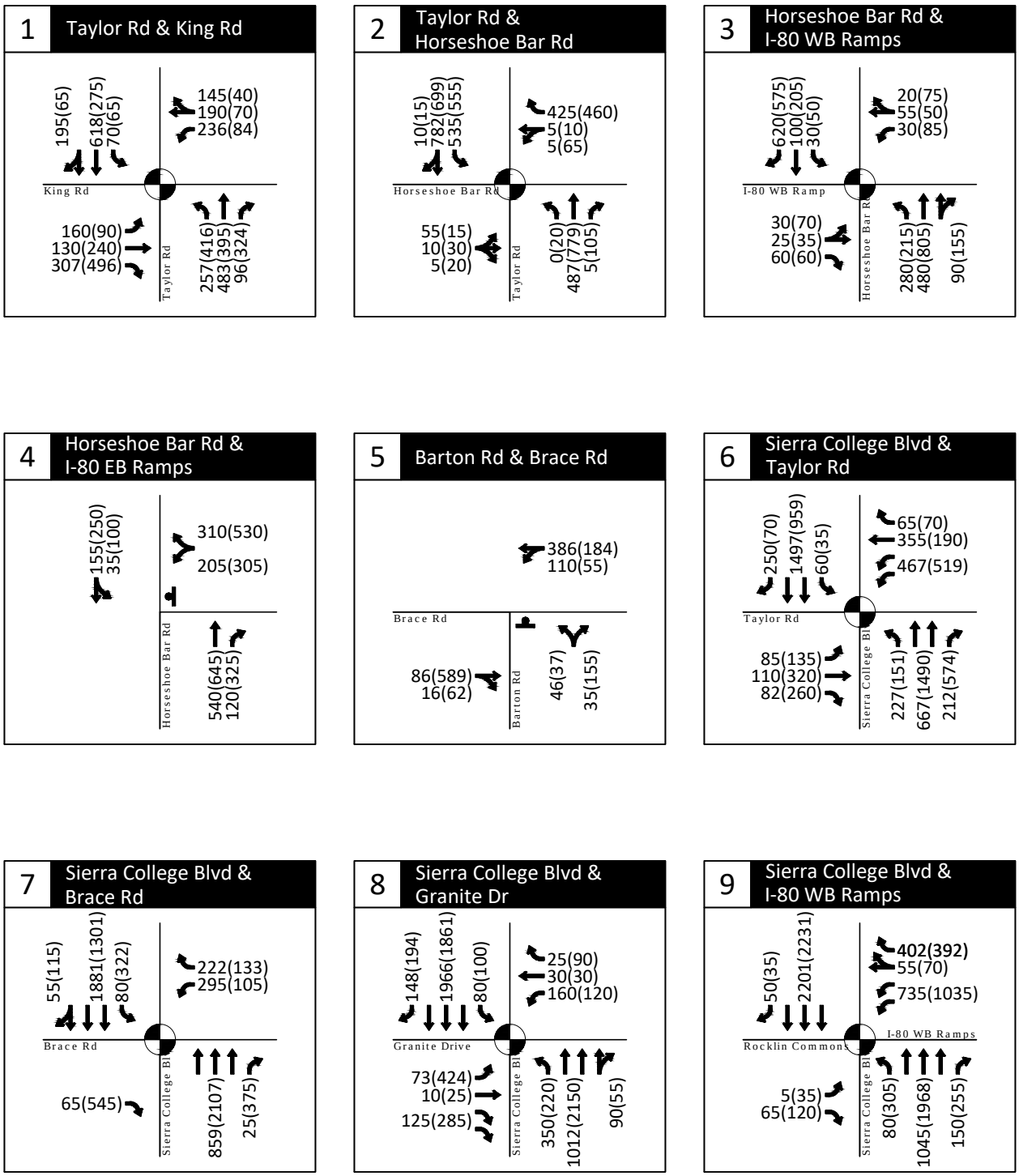
Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
DNE: Intersection does not exist.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicate significant Project impact
[1] An impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection. At these locations, the project does not contribute 5% or more of the volumes.
Source: Kittelson & Associates, Inc. 2019

Table 50: Cumulative Conditions – Long Term Traffic Condition, Weekend Midday Peak – Project Driveway Option 1A

ID	Intersection	Traffic Control Type	Long Term		Long Term plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
1	Taylor Rd/King Rd	Signal	29.5	C	32.9	C	3.4
2	Taylor Rd/Horseshoe Bar Rd	Signal	24.7	C	27.2	C	2.5
3	Horseshoe Bar Rd/I-80 Westbound Ramp	Signal	14.6	B	14.6	B	0.0
4	Horseshoe Bar Rd/I-80 Eastbound Ramp[1]	TWSC	**621.0**	**F**	**621.0**	**F**	0.0
5	Barton Rd/Brace Rd[1]	TWSC	**43.1**	**E**	**48.4**	**E**	5.3
6	Sierra College Blvd/Taylor Rd	Signal	33.2	C	**43.4**	**D**	10.2
7	Sierra College Blvd/Brace Rd	Signal	20.3	C	20.1	C	-0.2
8	Sierra College Blvd/Granite Dr	Signal	28.3	C	33.9	C	5.6
9	Sierra College Blvd/I-80 WB Ramps	Signal	42.2	D	62.2	E	20.0
10	Sierra College Blvd/I-80 EB Ramps	Signal	36.4	D	39.0	D	2.6
11	Sierra College Blvd/Schriber Way	Signal	16.0	B	16.1	B	0.1
12	Sierra College Blvd/Bass Pro Dr-Dominguez Rd	Signal	**74.0**	**E**	**79.2**	**E**	5.2
13	Sierra College Blvd/Stadium Dwy	Signal	7.4	A	7.7	A	0.3
14	Sierra College Blvd/Rocklin Rd	Signal	**50.9**	**D**	**54.2**	**D**	3.3
15	Pacific St/Dominguez Rd-Delmar Ave	Signal	**56.4**	**E**	**60.4**	**E**	4.0
16	Pacific St/Rocklin Rd	Signal	**35.3**	**D**	**36.8**	**D**	1.5
17	Granite Dr/Rocklin Rd	Signal	**35.3**	**D**	**39.5**	**D**	4.2
18	I-80 Westbound Ramps/Rocklin Rd	Signal	23.2	C	23.2	C	0.0
19	I-80 Eastbound Ramps/Rocklin Rd	Signal	18.8	B	18.8	B	0.0
20	Aguilar Rd/Rocklin Rd	Signal	11.1	B	11.2	B	0.1
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
22	Granite Dr/Dominguez Rd	Signal	**73.9**	**E**	**76.9**	**E**	3.0
23	El Don Dr/Rocklin Rd	Signal	12.6	B	12.9	B	0.3
24	Sierra College Boulevard/Project Driveway	Signal	**898.5**	**F**	29.8	C	-868.7
25	Brace Road/Project Driveway	TWSC	DNE		12.0	B	-
26	Sierra College Blvd/SR-193	Signal	**186.1**	**F**	**192.6**	**F**	6.5
27	Sierra College Blvd/English Colony Way	Signal	18.9	B	19.7	B	0.8
28	Sierra College Blvd/Delmar Avenue	Signal	3.3	A	3.4	A	0.1
29	Taylor Rd/English Colony Way	Signal	**48.8**	**D**	**50.0**	**D**	1.2
30	Taylor Rd/Penryn Road (North)	TWSC	11.3	B	11.4	B	0.1
31	Taylor Rd/Penryn Road (South)	Signal	17.1	B	17.0	B	-0.1

ID	Intersection	Traffic Control Type	Long Term		Long Term plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
32	Taylor Rd/Del Oro High School North Lot	TWSC	20.7	C	22.1	C	1.4
33	Taylor Rd/Del Oro High School Drop-Off[1]	TWSC	**29.5**	**D**	**32.6**	**D**	3.1
34	Taylor Rd/Del Oro High School South Lot	TWSC	20.8	C	21.8	C	1.0
35	Taylor Rd/Rippey Road	TWSC	11.2	B	11.5	B	0.3
36	Taylor Rd/Webb Street	TWSC	**435.6**	**F**	**721.9**	**F**	286.3
37	Brace Road/Project Driveway East	TWSC	DNE		12.9	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
N/A: Data not available at intersection.
DNE: Intersection does not exist.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates significant Project impact
[1] An impact is significant in situations when the intersection is already operating at unacceptable LOS and the Project adds trips to the intersection exceeding 5% of the total traffic already at the intersection. At these locations, the project does not contribute 5% or more of the volumes.
Source: Kittelson & Associates, Inc. 2019



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
28A

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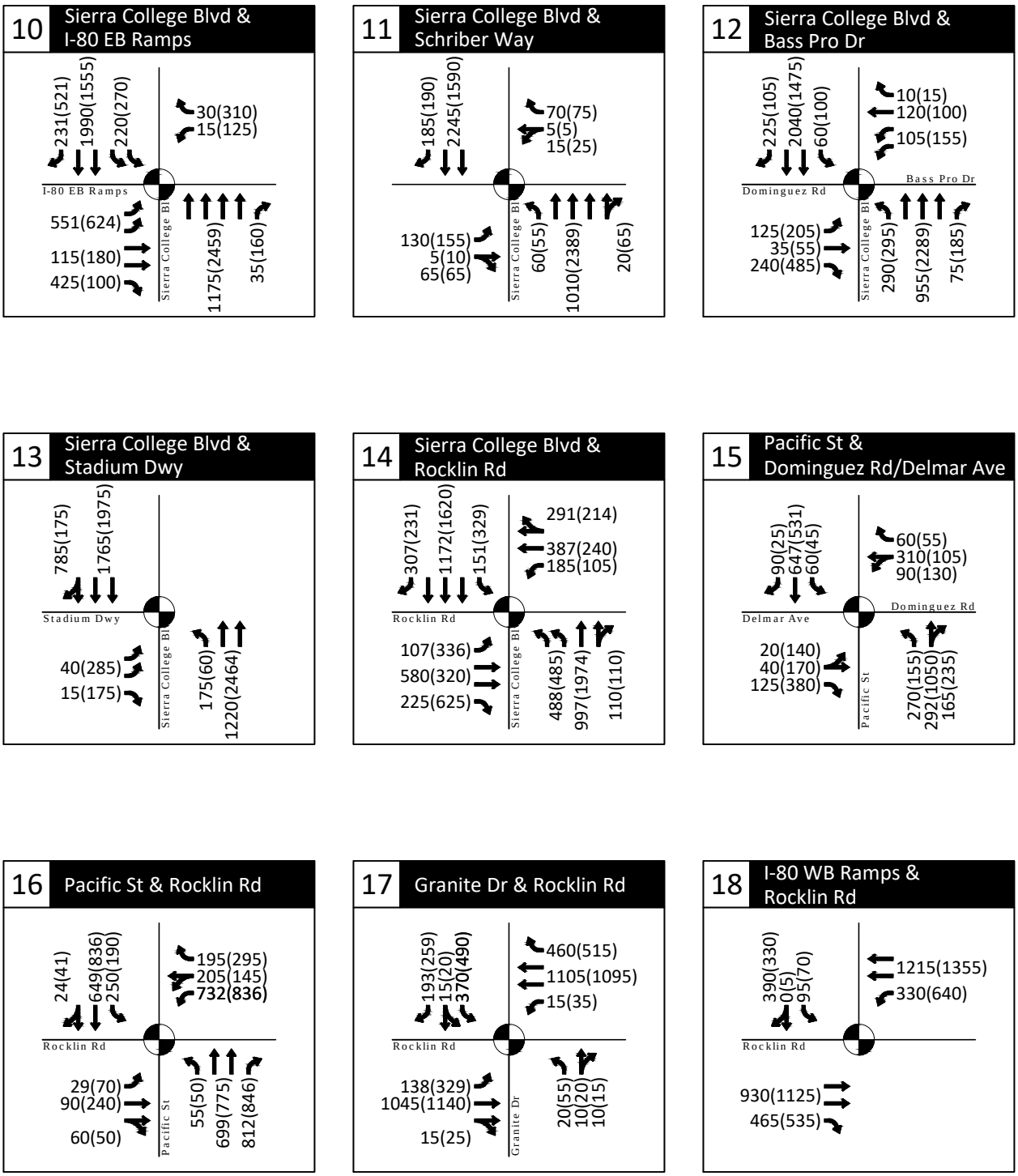


AM(PM) - Weekday Traffic Volume

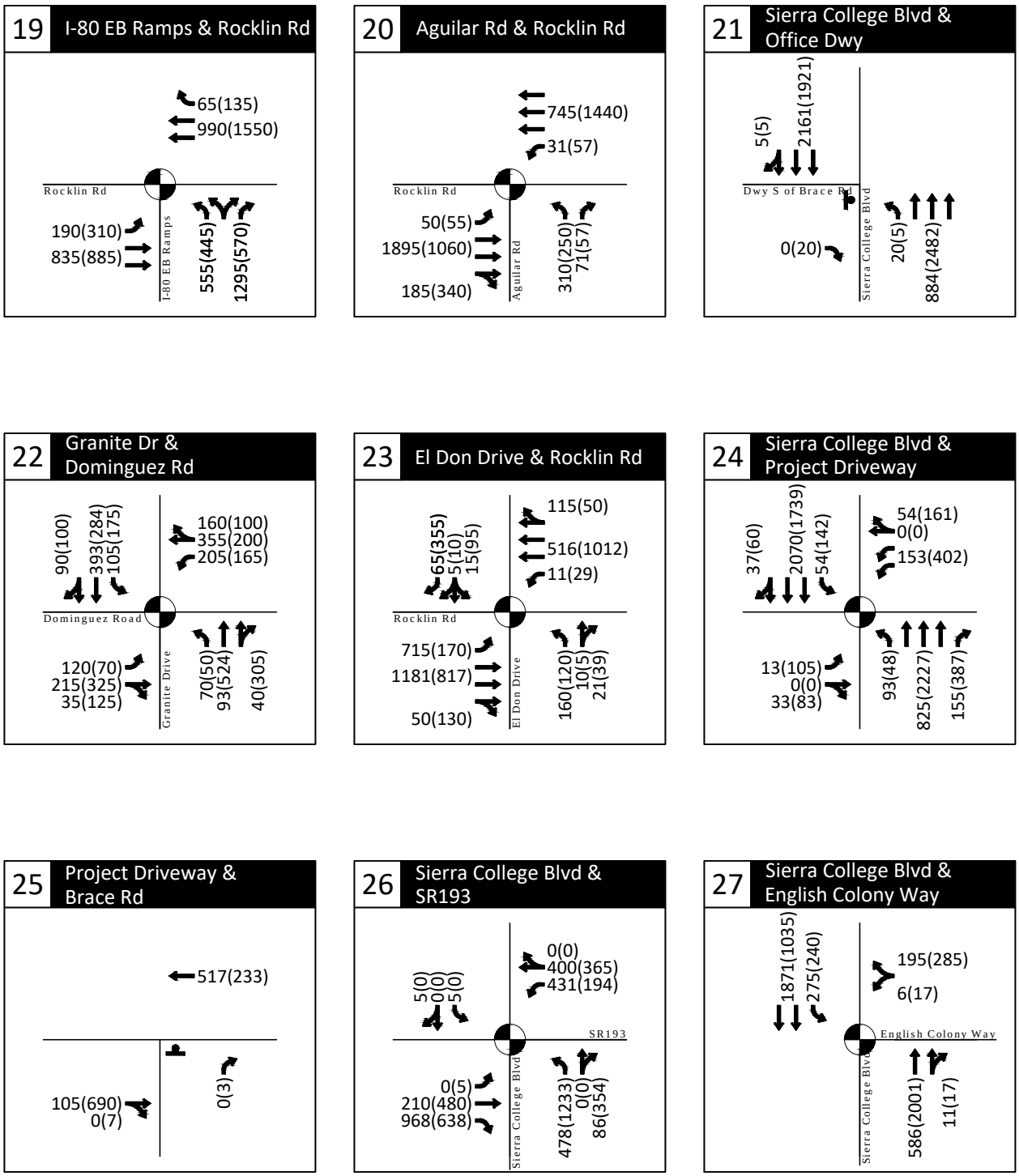
- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
28B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:38pm - aloveday Layout Tab: CumP AM_PM B



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
28C

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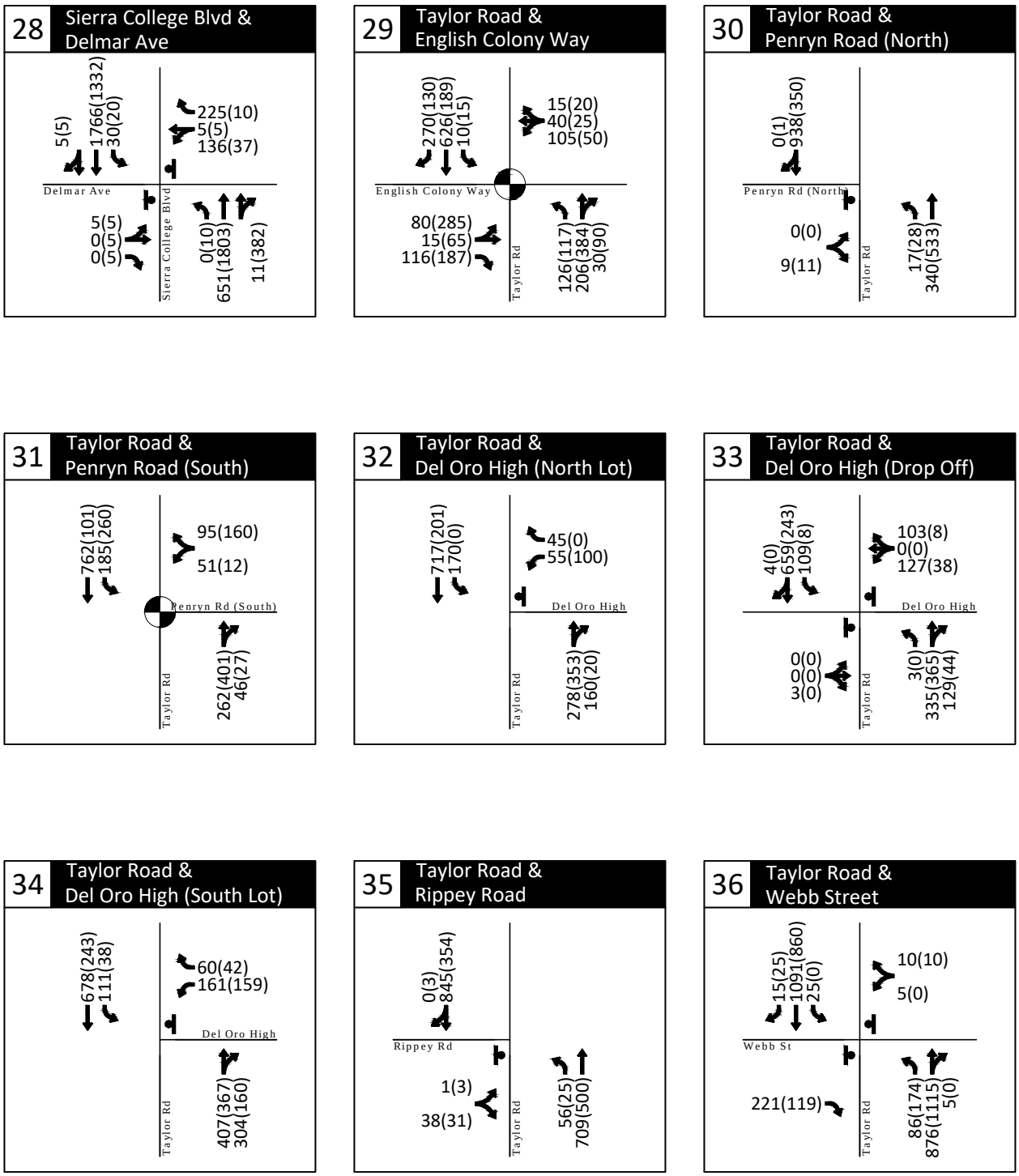

AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
28D

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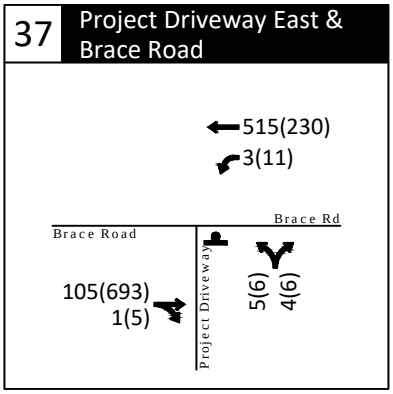


AM(PM) - Weekday Traffic Volume

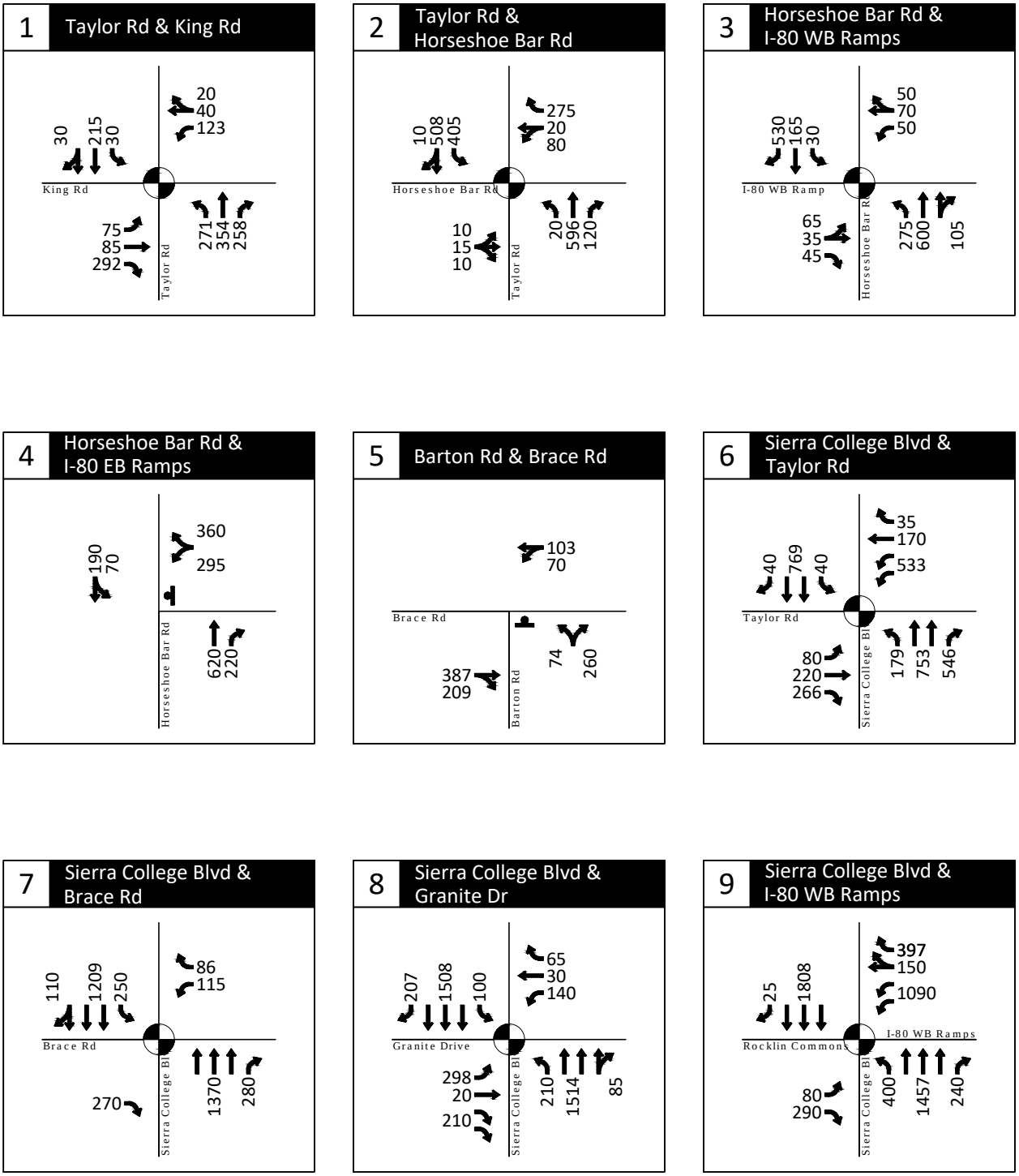
- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Option 1A
Loomis, California

Figure
28E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:39pm - aloveday Layout Tab: CumP AM_PM E



- Weekend Midday Traffic Volume

- Stop Sign

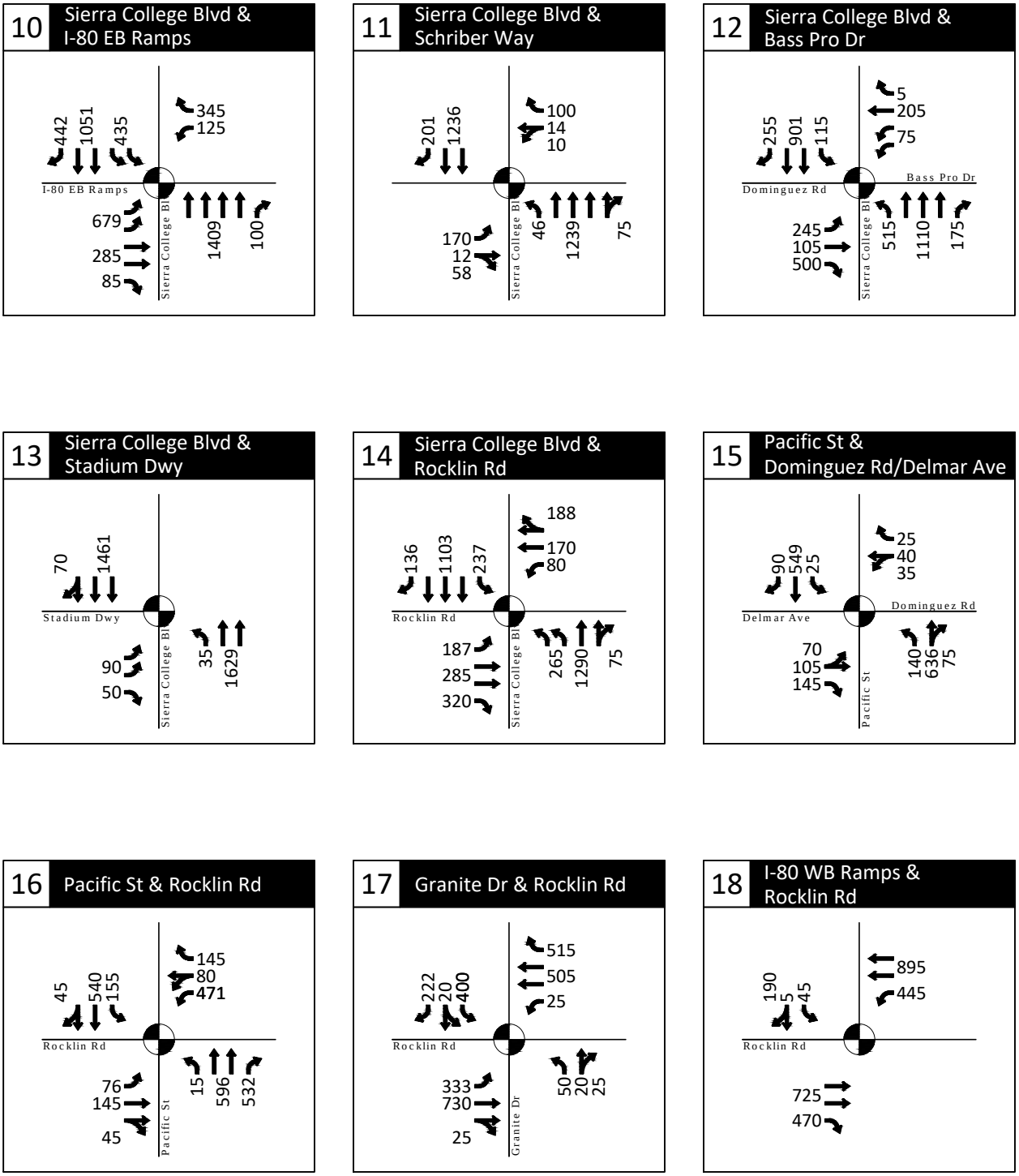
- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
29A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:39pm - aloveday Layout Tab: CumP SAT A

KITTELSON & ASSOCIATES



- Weekend Midday Traffic Volume

- Stop Sign

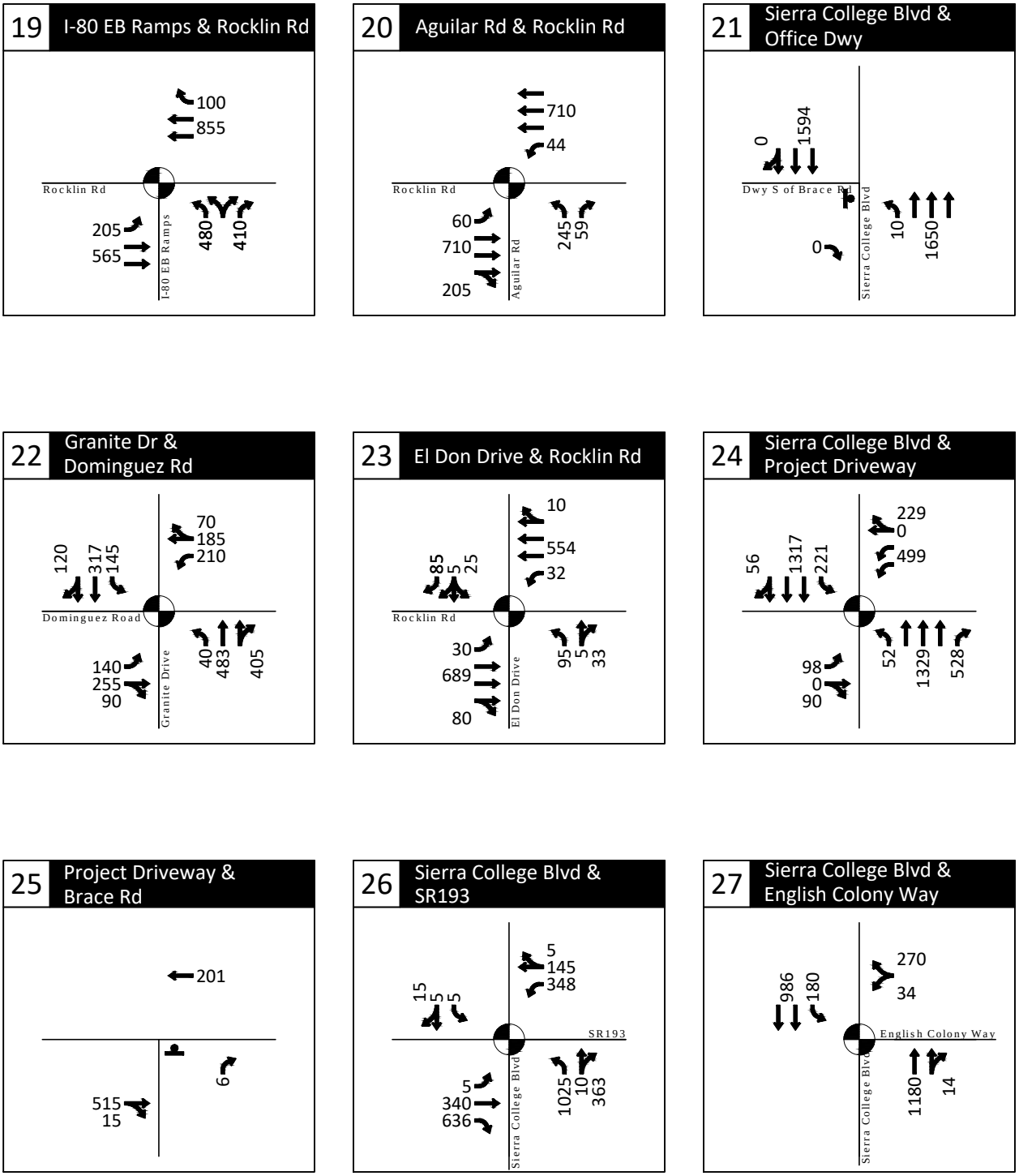
- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
29B

KITTELSON & ASSOCIATES

H:\20\20345 - Confidential Loomis Costco\dwgs\Figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:42pm - aloveday Layout Tab: CumP SAT B



- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
29C

KITTELSON & ASSOCIATES

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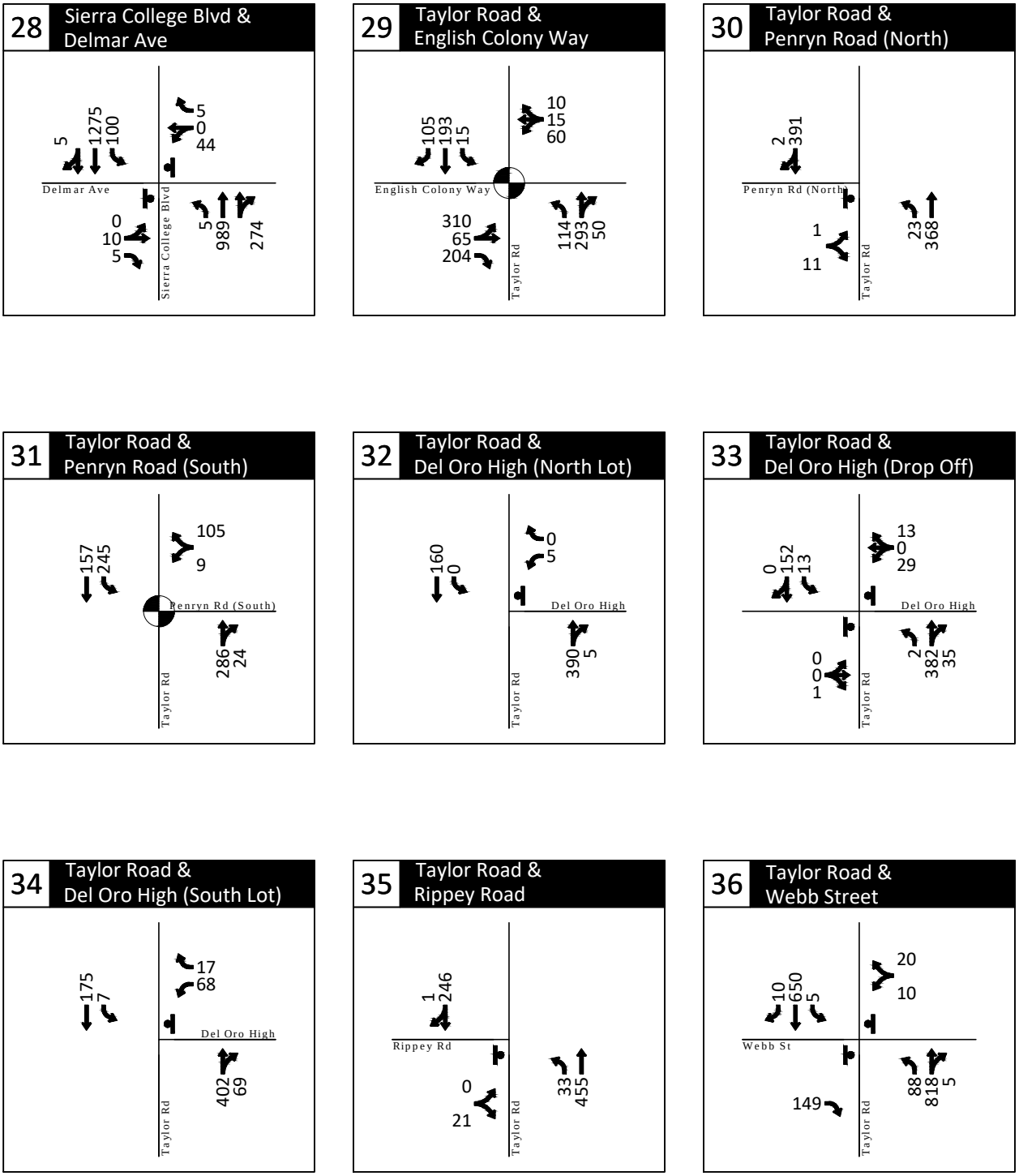

- Weekend Midday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
29D

KITTELSON & ASSOCIATES

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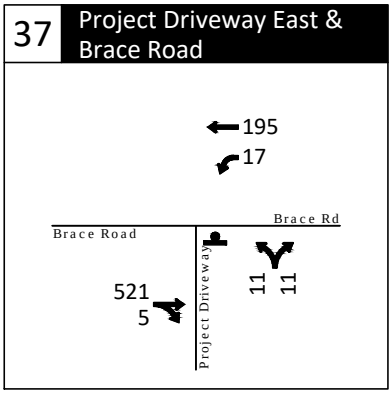


- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Option 1A
Loomis, California

Figure
29E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:43pm - aloveday Layout Tab: CumP SAT E

Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C would affect operations of study intersections 7, 8, 21, 24, 25, and 37 due to driveway trip routing. All other study intersections would operate the same under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Table 51 shows the baseline Cumulative Long Term No-Project and Plus Project delays and LOS for those study intersections affected by the options during the weekday AM and PM peak hours. Table 52 shows the baseline Cumulative Long Term No-Project and Plus Project delays and LOS for those study intersections affected by the options during the weekend midday peak hour.

As shown in the two tables, none of the six affected study intersections affected by site trip routing to the Project driveways are significantly impacted by the proposed Project for Project Driveway Options B and C

Table 51: Cumulative Long Term Plus Project - Intersection LOS Analysis, Weekday AM/PM Peak Hour – Project Driveway Options 1B & 1C

ID	Intersection	Traffic Control Type	Weekday AM					Weekday PM				
			Long Term		Plus Project		Change in Delay (sec)	Long Term		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS		Delay (sec)	LOS	Delay (sec)	LOS	
Driveway Option 1B												
7	Sierra College Blvd/ Brace Rd	Signal	12.9	B	48.0	D	35.1	**137.4**	**F**	**87.9**	**F**	-49.5
8	Sierra College Blvd/ Granite Dr	Signal	**36.4**	**D**	**38.8**	**D**	2.4	**68.5**	**E**	**55.3**	**E**	-13.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	1.2	A	1.2	A	0.0	23.5	C	24.6	C	1.1
24	Sierra College Blvd/ Project Driveway	Signal	**ERR[1]**	**F**	17.4	B	-	**6299.3**	**F**	31.3	C	-6198.0
25	Brace Road/ Project Driveway	TWSC	DNE		0.0	A	-	DNE		13.9	B	-
37	Brace Road/ Project Driveway East	TWSC	DNE					DNE				
Driveway Option 1C												
7	Sierra College Blvd/ Brace Rd	Signal	12.9	B	17.1	B	4.2	**137.4**	**F**	**76.5**	**F**	-60.9
8	Sierra College Blvd/ Granite Dr	Signal	**36.4**	**D**	**38.8**	**D**	2.4	**68.5**	**E**	**55.3**	**E**	-13.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	1.2	A	1.2	A	0.0	23.5	C	24.5	C	1.0
24	Sierra College Blvd/ Project Driveway	Signal	**ERR[1]**	**F**	17.3	B	-	**6299.3**	**F**	30.6	C	-6225.7
25	Brace Road/ Project Driveway	TWSC	DNE		0.0	A	-	DNE		13.9	B	-
37	Brace Road/ Project Driveway East	TWSC	DNE		10.9	B	-	DNE		14.6	B	-

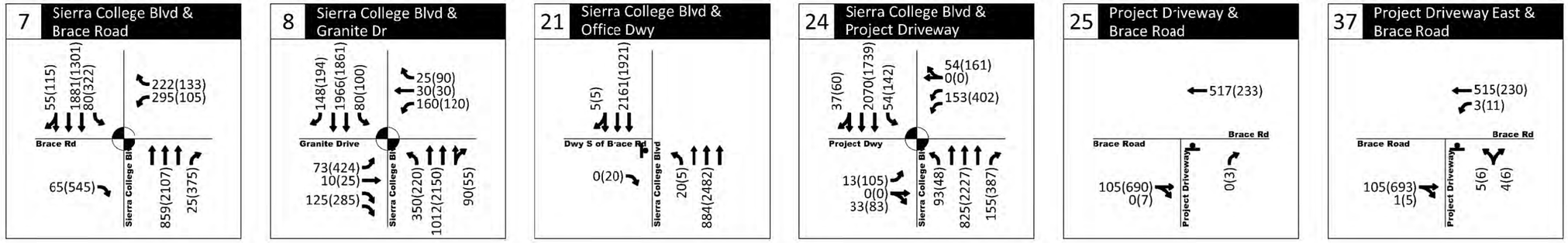
Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates significant Project impact
[1] Due to the high volumes, HCM2010 was unable to report approach delay
Source: Kittelson & Associates, Inc. 2019

Table 52: Cumulative Long Term Plus Project - Intersection LOS Analysis, Weekend Midday Peak Hour – Project Driveway Options 1B & 1C

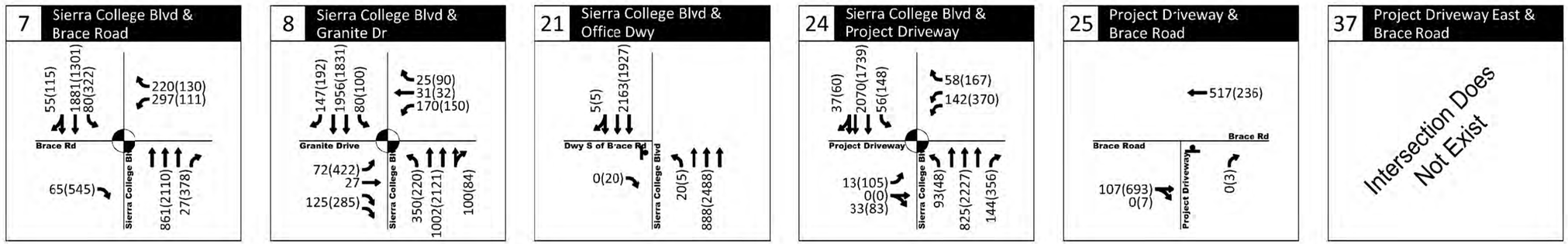
ID	Intersection	Traffic Control Type	Long Term		Plus Project		Change in Delay (sec)
			Delay (sec)	LOS	Delay (sec)	LOS	
Driveway Option 1B							
7	Sierra College Blvd/Brace Rd	Signal	20.3	C	29.4	C	9.1
8	Sierra College Blvd/Granite Dr	Signal	28.3	C	29.5	C	1.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
24	Sierra College Boulevard/Project Driveway	Signal	**898.5**	F	29.6	C	-868.9
25	Brace Road/Project Driveway	TWSC	DNE		12.0	B	-
37	Brace Road/Project Driveway East	TWSC	DNE				
Driveway Option 1C							
7	Sierra College Blvd/Brace Rd	Signal	20.3	C	19.8	B	-0.5
8	Sierra College Blvd/Granite Dr	Signal	28.3	C	29.5	C	1.2
21	Sierra College Blvd/Dwy South of Brace Rd	TWSC	0.1	A	0.1	A	0.0
24	Sierra College Boulevard/Project Driveway	Signal	**898.5**	F	28.3	C	-870.2
25	Brace Road/Project Driveway	TWSC	DNE		12.0	B	-
37	Brace Road/Project Driveway East	TWSC	DNE		12.9	B	-

Notes:
AWSC: All-way stop control – The average intersection delay is reported.
TWSC: Two-way stop control - The delay reported reflects the critical movement.
DNE: Intersection does not exist under no Project conditions.
Boldface type indicates intersections performing below acceptable LOS. Refer to Table 1 for applicable operating standards.
Shaded cell indicates significant Project impact
Source: Kittelson & Associates, Inc. 2019

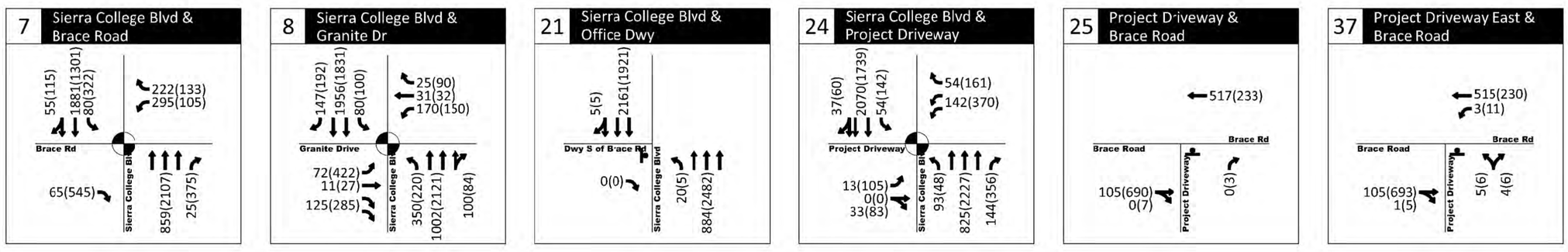
OPTION 1A



OPTION 1B



OPTION 1C



AM(PM) - Weekday Traffic Volume

- Stop Sign

- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekday AM and PM Peak Hours - Project Driveway Options 1B & 1C
Loomis, California

Figure 30

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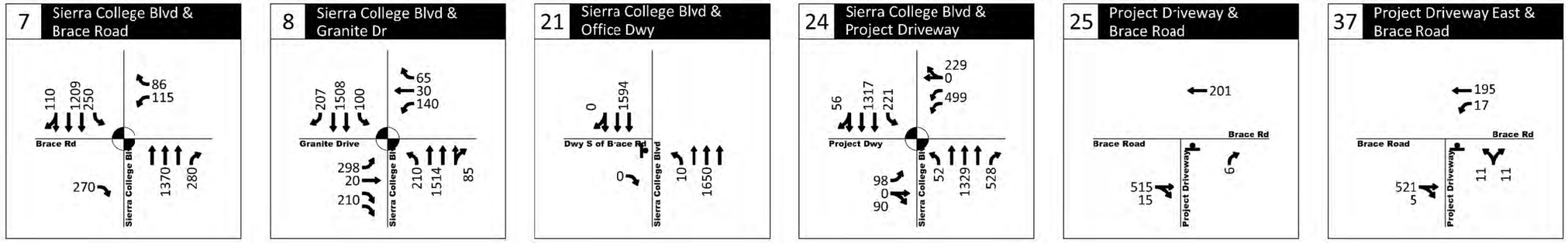
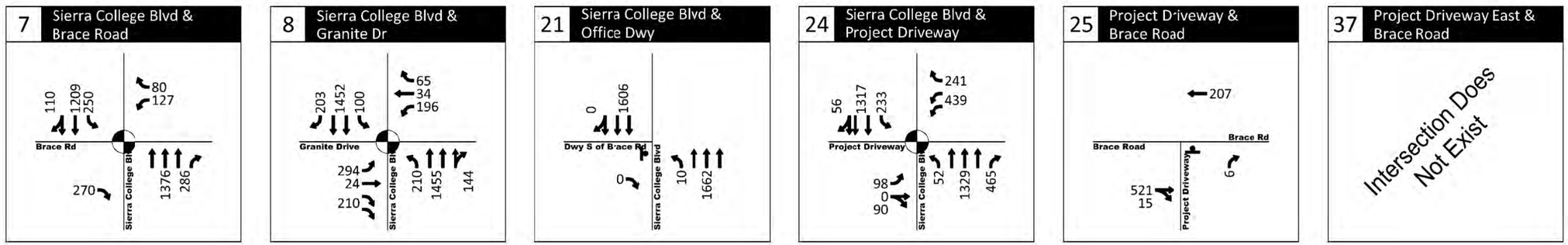
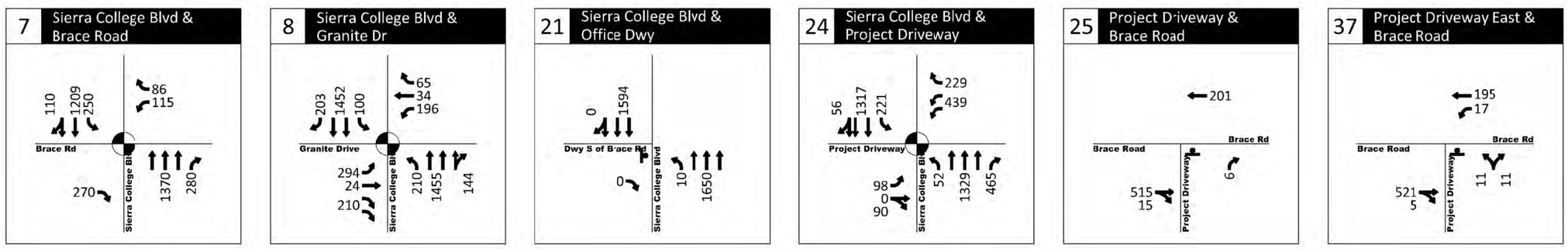
OPTION 1A



OPTION 1B



OPTION 1C



- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

Cumulative Long Term Plus Project Traffic Conditions
Weekend Midday Peak Hour - Project Driveway Options 1B & 1C
Loomis, California

Figure 31

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:37pm - aloveday Layout Tab: CumLtP-SAT

10.1.2 Queuing Analysis

Appendix C provides the queue summary tables for the weekday AM, PM and weekend midday peak hours and the corresponding queuing worksheets. Appendix "G" includes the Project contribution tables.

Project Driveway Option 1A

The queues at the following intersections would extend beyond the storage lengths available at these locations for Project Driveway Option 1A:

- Taylor Road & King Road (AM, PM, and MD)
- Taylor Road & Horseshoe Bar Road (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Westbound Ramp (AM, PM, and MD)
- Horseshoe Bar Road & I-80 Eastbound Ramp (PM and MD)
- Sierra College Boulevard & Taylor Road (AM, PM, and MD)
- Sierra College Boulevard & Brace Road (AM, PM, and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (AM, PM, and MD)
- Sierra College Boulevard & I-80 EB Ramps (AM, PM, and MD)
- Sierra College Boulevard & Schriber Way (AM, PM, and MD)
- Sierra College Boulevard & Bass Pro Drive/Dominguez Road (AM, PM, and MD)
- Sierra College Boulevard & Stadium Dwy (AM and PM)
- Sierra College Boulevard & Rocklin Road (AM, PM, and MD)
- Pacific Street & Dominguez Road/Delmar Avenue (AM and PM)
- Pacific Street & Rocklin Road (AM, PM, and MD)
- Granite Drive & Rocklin Road (AM, PM, and MD)
- I-80 Westbound Ramps & Rocklin Road (AM, PM, and MD)
- I-80 Eastbound Ramps & Rocklin Road (AM and PM)
- Aguilar Road & Rocklin Road (AM)
- Granite Drive & Dominguez Road (AM, PM, and MD)
- El Don Drive & Rocklin Road (AM and PM)
- Sierra College Boulevard & Project Driveway (AM, PM, and MD)
- Sierra College Boulevard & SR-193 (AM, PM, and MD)
- Sierra College Boulevard & English Colony Way (AM, PM, and MD)
- Sierra College Boulevard & Delmar Avenue (AM)
- Taylor Road & English Colony Way (AM, PM, and MD)
- Taylor Road & Penryn Road (south) (AM, PM, and MD)

- Taylor Road & Del Oro High School North Lot (AM)
- Taylor Road & Del Oro High School Drop Off (AM)
- Taylor Road & Del Oro High School South Lot (AM)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown:

- The westbound through at Horseshoe Bar Road & I-80 Eastbound Ramp would back up to the I-80 Eastbound mainline (PM and MD)
- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The southbound left-turn at Sierra College Boulevard & Brace Road would affect operations at Sierra College Boulevard & Taylor Road (PM)
- The northbound left-turn at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (AM)
- The northbound through at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM)
- The southbound through at Sierra College Boulevard & I-80 WB Ramps would affect operations at Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- The southbound through at Sierra College Boulevard & Schriber Way would affect operations at Sierra College Boulevard & I-80 EB Ramps (AM and PM)
- The southbound through at Sierra College Boulevard & Bass Pro Drive/Dominguez Road would affect operations at Sierra College Boulevard & Schriber Way (AM and PM)
- The westbound left-turn at I-80 Westbound Ramps & Rocklin Road would affect operations at I-80 Eastbound Ramps & Rocklin Road (PM)
- The westbound through at I-80 Eastbound Ramps & Rocklin Road would affect operations at Aguilar Road & Rocklin Road (PM)
- The northbound through at Sierra College Boulevard & Project Driveway would affect operations at Sierra College Boulevard & Granite Drive (PM)

Based on the intersection queuing significant impact criteria presented in Section 2 (Project traffic causes queue overflow or if queues overflow under no Project, the Project contributes 5% of the total traffic for the movement), an intersection queue significant impact occurs at the following intersections:

- Taylor Road & King Road (MD)
- Taylor Road & Horseshoe Bar Road (MD)
- Sierra College Boulevard & Taylor Road (PM and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & I-80 WB Ramps (AM, PM, and MD)
- Granite Drive & Rocklin Road (MD)

- Sierra College Boulevard & Project Driveway (MD)

Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C would affect operations of study intersections 7, 8, 21, 24, 25, and 37 due to site driveway trip routing. All other study intersections would operate the same under Project Driveway Options 1B and 1C as they would under Project Driveway Option 1A. Of the six intersections affected by the driveway options, one or more 95th percentile queues would extend beyond the available storage lengths at the following intersections:

- Sierra College Boulevard & Brace Road (AM, PM, and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & Project Driveway (AM, PM, and MD)

In addition, the queues reported at the above locations would affect operations at the upstream locations as shown (for those intersections affected by the driveway options):

- The northbound through at Sierra College Boulevard & Taylor Road would affect operations at Sierra College Boulevard & Brace Road (PM)
- The southbound left-turn at Sierra College Boulevard & Brace Road would affect operations at Sierra College Boulevard & Taylor Road (PM)
- The northbound left-turn at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (AM)
- The northbound through at Sierra College Boulevard & Granite Drive would affect operations at Sierra College Boulevard & I-80 WB Ramps (PM)
- The northbound through at Sierra College Boulevard & Project Driveway would affect operations at Sierra College Boulevard & Granite Drive (PM)

Based on the intersection queuing significant impact criteria presented in Section 2 (Project traffic causes queue overflow or if queues overflows under no Project, the Project contributes 5% of the total traffic for the movement), an intersection queue significant impact occurs at the following affect study area intersections:

- Sierra College Boulevard & Brace Road (PM[17] and MD)
- Sierra College Boulevard & Granite Drive (AM, PM, and MD)
- Sierra College Boulevard & Project Driveway (MD)

[17] Weekday PM peak hour impacted for Project Driveway Option 1B only.

10.1.3 Supplemental Simulation Evaluation

The Cumulative Long Term plus Project conditions simulation evaluation was conducted with the same assumptions as outlined in Section 9.0 for Cumulative Long Term Conditions.

Project Driveway Option 1A

The Cumulative Long Term plus Project conditions simulation evaluation network performance results for Project Driveway Option 1A are presented in Table 53 and the arterial performance results are presented in Table 54. Please note that signal timing was not modified with the addition of Project trips. Recognizing the corridor is congested prior to adding Project trips, the two tables reflect increases in delay and the number of vehicles denied entry. Specifically, for the Sierra College Boulevard corridor, the Project increases delay, travel time, and reduces arterial speed for all peak hours and direction with the exception of weekday AM peak hour.

Table 53: Cumulative Long Term plus Project Conditions – Simulation Total Network Performance Results for Project Driveway Option 1A

Peak Hour	Long Term				Long Term plus Project			
	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry
AM	173.9	9,765	9,377	1,099	266.0	9,038	8,196	1,104
PM	198.6	11,954	11,718	2,258	338.3	10,021	9,066	2,829
MD	106.2	11,316	11,208	625	222.8	10,519	9,773	1,349

Notes:
(s): seconds

Total Delay/Vehicle: Total delay is equal to the travel time minus the travel time for a vehicle with no other vehicles or control devices. This delay is divided by the number of vehicles to obtain the total delay per vehicle.

Vehicles Entered/Exited: Represents the number of vehicles counted entering and exiting the link or area during the interval. This value does not include vehicles moving from one intersection to the next with the arterial or network.

Vehicles Denied Entry: This value represents the number of vehicles unable to enter a link due to congestion and are waiting to enter. These vehicles can either be from an external link or from a mid-block source.

Source: Kittelson & Associates, Inc. 2019

Table 54: Cumulative Long Term plus Project Conditions – Simulation Sierra College Boulevard Arterial Performance Results for Project Driveway Option 1A

Segment	Peak Hour	Direction	Long Term			Long Term plus Project		
			Delay (s)	Travel Time (s)	Arterial Speed (mph)	Delay (s)	Travel Time (s)	Arterial Speed (mph)
Sierra College Boulevard between Taylor Road to Stadium Way	AM	Northbound	291.2	417.2	13	241.4	414.6	13
		Southbound	468.0	1,361.8	11	1,009.1	1,499.3	5
	PM	Northbound	471.5	1,611.8	9	1,130.6	2,527.8	4
		Southbound	419.7	776.8	11	527.0	735.3	9
	MD	Northbound	246.4	662.3	15	460.0	663.8	8
		Southbound	273.9	447.5	16	655.5	879.9	8

Notes:
(s): seconds
Total Delay: Total Delay for the average vehicle traveling the length of the corridor including stopped delay and congestion delay.
Total Travel Time: Time in seconds for the average vehicle to travel the length of the corridor.
Average Arterial Speed: Average speed of the average vehicle traveling the length of the corridor.
Source: Kittelson & Associates, Inc. 2019

It should be noted that the simulation results are inherently conservative considering the cumulative nature of how the Project trips were added without accounting for diversion of existing trips to and from the Roseville Costco and that the cumulative conditions do not necessarily fully account for trips made between residential, commercial, and employment uses within the developing community.

Project Driveway Options 1B & 1C

Project Driveway Options 1B and 1C affect operations along the simulated portion of the Sierra College Boulevard Corridor; therefore Cumulative Long Term plus Project conditions simulation evaluation was also conducted for Project Driveway Options 1B and 1C for informational purposes. The total network performance results of the simulation runs are presented in Table 55 and the arterial performance results are presented in Table 56. Please note that signal timing was not modified with the addition of Project trips.

As shown, the Project traffic increases network delay for all peak hours. In addition, the increased congestion on the network results in vehicles being denied entry into the network during the simulation period.

Table 55: Cumulative Long Term Plus Project Conditions – Simulation Total Network Performance Results – Project Driveway Options 1B & 1C

Peak Hour	Long Term				Long Term Plus Project			
	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry	Total Delay/Vehicle (s)	Vehicles Entered	Vehicles Exited	Vehicles Denied Entry
Driveway Option 1B								
AM	173.9	9,765	9,377	1,099	169.6	10,287	9,941	1,197
PM	198.6	11,954	11,718	2,258	207.7	13,196	12,936	2,544
MD	106.2	11,316	11,208	625	160.0	12,743	12,361	1,126
Driveway Option 1C								
AM	173.9	9,765	9,377	1,099	268.2	9,004	8,142	1,194
PM	198.6	11,954	11,718	2,258	268.9	10,390	9,487	2,453
MD	106.2	11,316	11,208	625	187.6	11,038	10,411	740

Notes:
(s): seconds
Total Delay/Vehicle: Total delay is equal to the travel time minus the travel time for a vehicle with no other vehicles or control devices. This delay is divided by the number of vehicles to obtain the total delay per vehicle.

Vehicles Entered/Exited: Represents the number of vehicles counted entering and exiting the link or area during the interval. This value does not include vehicles moving from one intersection to the next with the arterial or network.

Vehicles Denied Entry: This value represents the number of vehicles unable to enter a link due to congestion and are waiting to enter. These vehicles can either be from an external link or from a mid-block source.

Source: Kittelson & Associates, Inc. 2019

As shown, for the Sierra College Boulevard corridor, the Project increases delay, travel time, and reduces arterial speed for each of the peak hours analyzed. The detailed network and arterial performance output sheets are presented in Appendix "D".

Table 56: Cumulative Long Term Plus Project Conditions – Simulation Sierra College Boulevard Arterial Performance Results – Project Driveway Options 1B & 1C

Segment	Peak Hour	Direction	Long Term			Long Term Plus Project		
			Delay (s)	Travel Time (s)	Arterial Speed (mph)	Delay (s)	Travel Time (s)	Arterial Speed (mph)
Driveway Option 1B								
Sierra College Boulevard between Taylor Road and Stadium Way	AM	Northbound	291.2	417.2	13	245.2	377.1	15
		Southbound	468.0	1,361.8	11	454.8	1,151.3	11
	PM	Northbound	471.5	1,611.8	9	472.0	1,410.4	9
		Southbound	419.7	776.8	11	533.5	871.5	9
	MD	Northbound	246.4	662.3	15	307.7	822.5	12
		Southbound	273.9	447.5	16	608.5	1,051.4	9
Driveway Option 1C								
Sierra College Boulevard between Taylor Road and Stadium Way	AM	Northbound	291.2	417.2	13	229.5	400.2	13
		Southbound	468.0	1,361.8	11	947.4	1,340.4	6
	PM	Northbound	471.5	1,611.8	9	626.5	1,282.6	7
		Southbound	419.7	776.8	11	612.8	822.9	8
	MD	Northbound	246.4	662.3	15	443.0	657.2	9
		Southbound	273.9	447.5	16	502.7	728.6	9

Notes:
Total Delay: Total Delay for the average vehicle traveling the length of the corridor including stopped delay and congestion delay.
Total Travel Time: Time in seconds for the average vehicle to travel the length of the corridor.
Average Arterial Speed: Average speed of the average vehicle traveling the length of the corridor.
Source: Kittelson & Associates, Inc. 2019

10.2 PLACER COUNTY ROADWAY OPERATIONS

Analysis for the study segments was conducted using the LOS criteria defined as noted in Section 3.1. The three Project driveway options do not affect the Project traffic volumes for the roadway segments analyzed. Table 57 outlines the Cumulative Long Term with and without Project roadway volumes and associated level of service for the study segments and is applicable for all three Project driveway options.

As shown, Sierra College Boulevard between English Colony Way to the Loomis Town Limits continues to exceed the County's LOS C standard. The Project adds approximately 220 vehicles on the roadway segment which is under the impact threshold of 100 vehicles per lane, therefore the Project does not cause a significant impact. A second impact criteria is if the Project causes an increase in the V/C of 0.05 or more. Using the LOS E roadway capacity of 36,000 vehicles, the Long Term V/C is approximately 0.871 and for Long Term plus Project conditions the V/C is approximately 0.877. Therefore, the Project would contribute 0.006 to the V/C which is well under the 0.05 impact criteria and would not cause a significant impact under the secondary impact criteria.

Table 57: Cumulative Long Term plus Project Conditions – Placer County Weekday ADT Roadway Segment LOS Analysis

Roadway	Segment	Number of Lanes	Long Term		Long Term plus Project		
			ADT	LOS	Project ADT	ADT	LOS
Sierra College Boulevard (SCB)	SR-193 to English Colony Way	4	20,150	A	180	20,330	A
	English Colony Way to Delmar Ave	4	31,360	D	200	31,560	D
	Delmar Ave to Loomis Town Limits	4	29,920	D	220	30,140	D
SR-193	Lincoln City Limits to SCB	4	26,530	C	90	26,620	C
	SCB to Clark Tunnel Road	2	11,880	B	50	11,930	B

Notes:
ADT volumes sourced from Bickford Ranch Specific Plan EIR Addendum (October 2015) and adjusted based on City of Rocklin Travel Demand Model Growth Rates.
Source: Kittelson & Associates, Inc. 2019

10.3 FREEWAY FACILITIES EVALUATION

Cumulative Long Term Conditions traffic baseline traffic volumes for the weekday AM and PM peak hours were added to the site-generated traffic to arrive at the total traffic volumes.

10.3.1 Freeway Mainline Basic Segment Analysis

The three Project driveway options do not affect the Project traffic volumes for the freeway segments analyzed. Table 58 through Table 60 outline the Cumulative Long Term and Cumulative Long Term plus Project mainline volume, density and associated level of service for the study segments, and are applicable for all three Project driveway options. As shown two study segments exceed the acceptable LOS D with Project traffic:

- I-80 east of Sierra College Boulevard – Westbound (PM)
- I-80 west of Sierra College Boulevard – Westbound (PM)

No significant impacts occur to the freeway mainline under the Cumulative Long Term plus Project Conditions for all Project driveway options considered because there is no change in the LOS E projected under baseline (no project) conditions.

Appendix “E” includes the freeway mainline level-of-service worksheets.

Table 58: Cumulative Long Term – I-80 Mainline LOS Analysis, Weekday AM Peak Hour

ID	Segment	Direction	Long Term			Long Term plus Project			Change in Density
			Volume	Density	LOS	Volume	Density	LOS	
1	I-80 east of Sierra College	Eastbound	4,780	30.09	D	4,802	31.1	D	0.2
		Westbound	4,700	30.7	D	4,723	30.9	D	0.2
2	I-80 west of Sierra College	Eastbound	5,000	33.0	D	5,007	33.1	D	0.1
		Westbound	4,290	27.1	D	4,267	27.2	D	0.1

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

Table 59: Cumulative Long Term – I-80 Mainline LOS Analysis, Weekday PM Peak Hour

ID	Segment	Direction	Long Term			Long Term plus Project			Change in Density
			Volume	Density	LOS	Volume	Delay	LOS	
1	I-80 east of Sierra College	Eastbound	5,060	30.9	D	5,131	31.5	D	0.6
		Westbound	5,440	35.8	E	5,507	36.6	E	0.8
2	I-80 west of Sierra College	Eastbound	4,440	26.1	D	4,459	26.2	D	0.1
		Westbound	5,50	37.1	E	5,570	37.3	E	0.2

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

Table 60: Cumulative Long Term – I-80 Mainline LOS Analysis, Weekend MD Peak Hour

ID	Segment	Direction	Long Term			Long Term plus Project			Change in Density
			Volume	Density	LOS	Volume	Delay	LOS	
1	I-80 east of Sierra College	Eastbound	5,340	32.4	D	5,470	33.7	D	1.3
		Westbound	5,030	28.9	D	5,167	30.0	D	1.1
2	I-80 west of Sierra College	Eastbound	5,350	32.5	D	5,389	32.9	D	0.4
		Westbound	5,050	29.0	D	5,088	29.3	D	0.3

Notes:
Density: passenger cars/mile/lane
Source: Kittelson & Associates, Inc. 2019

10.3.2 Ramp Metering Supplemental Evaluation

The evalaution was prepared for informational purposes. The three Project driveway options do not affect the Project traffic volumes for the freeway ramps analyzed. Table 61 summarizes the projected queues associated with ramp metering assuming the ramp metering rate under no-Project conditions is held constant under plus Project conditions. The results are applicable for all three Project driveway options. The calculated queues with Project trips can be accommodated within the 1,200 feet of available storage area for all Project driveway options considered. Appendix "I" includes the ramp metering worksheets.

Table 61: Cumulative Long Term Plus Project – I-80 Westbound Slip-Ramp Ramp Meter Analysis

Peak Hour	Long Term		Long Term plus Project	
	Meter Rate (vehicles/hour)	Calculated Queue (feet)	Meter Rate (vehicles/hour)	Calculated Queue (feet)
AM	240	0	240	0
PM	450	473	450	954
MD	450	134	450	563

Notes:
Boldface type indicates if queue exceeds available ramp storage capacity of 1,200 feet.
Source: Kittelson & Associates, Inc. 2019

10.4 PEDESTRIAN AND BICYCLE EVALUATION

The proposed Project would provide pedestrian facilities on-site linking with public facilities along the site frontages on Sierra College Boulevard and Brace Road to provide connectivity with existing facilities. The project would reconstruct the Type II bicycle facility on Sierra College Boulevard northbound along the site frontage, including providing separate northbound right-turn lanes at the proposed signalized Project access and at Brace Road. In addition, the Project would provide bicycle parking on site for both members and employees.

Due to the nature of products and services provided by the Project, the Project would minimally increase pedestrian and bicycle traffic in the study area. Sidewalk connections would be provided along the Project site frontage with the proposed development along Sierra College Boulevard. The Project site would not be in conflict with applicable Town pedestrian and bicycle plans for any of the Project driveway options considered. The Project would have a less than significant impact on pedestrian and bicycle facilities.

10.5 TRANSIT EVALUATION

Due to the nature of products and services provided by the Project and limited transit connectivity provided adjacent to the site, the Project would minimally increase transit ridership in the study area. The nearest stop is approximately 0.6 mile from the Project site for routes with one hour and two hour headways. Due to the distance to the stop, relatively long headways, and employee shift times, it is unlikely that a significant number of employee trips would be added to the transit network. The project site would not be in conflict with applicable Placer County Transit plans or encroach on any lines or stops. The Project would have a less than significant impact on transit services and a new transit stop is not warranted at the Project site.

Project impacts on traffic flow could affect travel time for transit vehicles. Traffic flow impacts are addressed in the intersection evaluation sections of this study for all Project driveway options considered.

Section 11
Mitigation Measures

11.0 MITIGATION MEASURES

The following section outlines the mitigation measures and significance of each Project impact.

To reduce intensity of impacts to less than significant impact under CEQA, the following lists potential types of traffic mitigation measures for intersections:

- TR MM 1: Modify signal timing. Modify signal timing (to optimize cycle length and/or splits) at specific intersections to improve LOS and intersection operations.
- TR MM 2: Provide signal coordination. Provide signal communication interconnect to implement corridor signal timing plans.
- TR MM 3: Modify signal phasing. Modify traffic signal phasing sequence to improve LOS and intersection operations.
- TR MM 4: Restripe Intersection. Restripe intersection approaches to improve LOS and intersection operations.
- TR MM 5: Add exclusive turn lanes. Add exclusive turn lanes to improve LOS and intersection operations.
- TR MM 6: Provide a traffic signal.
- TR MM7: Provide additional storage. Modify median to provide additional storage for turn lane.

11.1 EXISTING PLUS PROJECT CONDITIONS

The following mitigation measures were evaluated to reduce the Project impacts to less than significant levels under CEQA. Table 62 presents the intersection and queuing mitigation measures under Existing plus Project Conditions.

Table 62: Existing plus Project Mitigation Measures

ID	Intersection	Project Driveway Option(s) Requiring Mitigation	Jurisdiction	Impact Type	Current Traffic Control	Mitigation Measure	Specific Actions Recommended	Effects of Mitigation
1	Taylor Road & King Road	Options 1A, 1B, 1C	Loomis	Queue	Signal	TR MM 1: Modify signal timing	Provide optimized cycle length with optimized splits based on current demand (110 second for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
7	Sierra College Boulevard & Brace Road	Option 1B	Loomis	Queue	Signal	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Restripe the westbound right lane to a shared westbound left-right lane. Optimize cycle length and splits (60 seconds for PM and MD peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
8	Sierra College Boulevard & Granite Dr	Option 1A	Rocklin	Queue	Signal	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Restripe northbound right turn lane to shared through-right lane. Optimize cycle length with optimized splits based on current demand. (115 seconds for PM peak hour)	Provides additional through lane, allowing more vehicles to travel through the intersection
8	Sierra College Boulevard & Granite Dr	Options 1B, 1C	Rocklin	Queue	Signal	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Restripe westbound through lane to left turn and restripe westbound right turn lane to a shared through-right lane. Optimize cycle length with optimized splits based on current demand. (95 seconds for AM peak hour, 115 seconds for PM peak hour, and 95 seconds MD peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
9	Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	Caltrans	Queue	Signal	TR MM 1: Modify signal timing	Provide optimized cycle length with optimized splits based on current demand (105 seconds for PM peak hour and 115 second for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
17	Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Rocklin	Queue	Signal	TR MM 1: Modify signal timing	Provide optimized cycle length with optimized splits based on current demand (100 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
26	Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	Placer	LOS	TWSC	TR MM 6: Provide a traffic signal	Install a traffic signal.[1]	Provides protected time (stops major street) to facilitate minor street movements
31	Taylor Road & Penryn Road (South)	Options 1A, 1B, 1C	Placer	LOS	TWSC	TR MM 6: Provide a traffic signal	Install a traffic signal. [1]	Provides protected time (stops major street) facilitate minor street movements
36	Taylor Road & Webb Street	Options 1A, 1B, 1C	Loomis	LOS	TWSC	TR MM 4: Restripe Intersection[2]	Eliminate 3 parking spaces on the north side of Webb Street and provide a 50 foot westbound right turn pocket.	Provides right turn lane, allowing these vehicles to move through intersection without waiting behind left/through vehicles

Notes:
[1] Traffic signal warrants met for impacted condition and provided in Appendix J.
[2] This intersection does not meet traffic signal warrants for impacted condition.
Source: Kittelson & Associates, Inc. 2019

The proposed mitigation measures were applied to the study intersections to evaluate LOS and queuing effects. Table 63 presents the LOS results in comparison to no Project conditions and Table 64 outlines the corresponding queueing results. The mitigation measures would reduce the LOS and queue impacts to less than significant levels at some of the impacted locations; however, significant and unavoidable impacts remain as noted. Some impacts are deemed to be significant and unavoidable impacts because the intersections are located beyond the Town of Loomis (lead agency) jurisdiction.

Appendix "B" includes the level-of-service worksheets and Appendix "C" contains the queueing worksheets.

Table 63: Existing Plus Project - Intersection LOS Analysis, Mitigation Results

ID	Intersection	Jurisdiction	Scenario	Existing		Existing Plus Project Mitigated		Change in Delay (sec)	Impact with mitigation?
				Delay (sec)	LOS	Delay (sec)	LOS		
Project Driveway Option 1A									
26	Sierra College Blvd & SR-193	Placer	PM	43.1	E	9.1	A	-34.0	Significant unavoidable*
31	Taylor Road & Penryn Road (South)	Placer	AM	233.5	F	9.3	A	-224.2	Significant unavoidable*
36	Taylor Road & Webb Street	Loomis	MD	70.2	F	99.1	F	28.9	Significant unavoidable[1]
Project Driveway Option 1B									
26	Sierra College Blvd & SR-193	Placer	PM	Same results as Project Driveway Option 1A					
31	Taylor Road & Penryn Road (South)	Placer	AM	Same results as Project Driveway Option 1A					
36	Taylor Road & Webb Street	Loomis	MD	Same results as Project Driveway Option 1A					
Project Driveway Option 1C									
26	Sierra College Blvd & SR-193	Placer	PM	Same results as Project Driveway Option 1A					
31	Taylor Road & Penryn Road (South)	Placer	AM	Same results as Project Driveway Option 1A					
36	Taylor Road & Webb Street	Loomis	MD	Same results as Project Driveway Option 1A					

Notes:

*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction authority to implement and determine feasibility.

[1] Temporary impact given this impact can be mitigated with the westbound right-turn mitigation measure under Short Term and Long Term conditions. Traffic volumes projected at intersection do not meet signal traffic warrants. Note that an alternative route is available for Webb Street traffic traveling to Taylor Road by routing to the traffic signal at Taylor Road/Horseshoe Bar Road. Further, the Project does not add trips to the failing approach.

Source: Kittelson & Associates, Inc. 2019

Table 64: Existing Plus Project - Intersection Queuing Analysis, Mitigation Results

ID	Intersection	Jurisdiction	Peak Hour	Movement	Storage (feet)	No Project Queue (feet)	Mitigated Queue (feet)	Impact with mitigation?
Project Driveway Option 1A								
1	Taylor Road & King Road	Loomis	MD	WBL	95	133	126	Less than significant
8	Sierra College Boulevard & Granite Drive	Rocklin	PM	NBT	370	325	245	Significant unavoidable*
				SBT	495	427	443	Significant unavoidable*
				EBL	185	217	183	Significant unavoidable*
9	Sierra College Boulevard & I-80 WB Ramps	Caltrans	PM	SBT	370	378	365	Significant unavoidable*
			MD	SBT	370	268	361	Significant unavoidable*
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	294	211	Significant unavoidable*
Project Driveway Option 1B								
1	Taylor Road & King Road	Loomis	MD	WBL	95	Same results as Project Driveway Option 1A		
7	Sierra College Boulevard & Brace Road	Loomis	PM	WBL	100	92	72	Less than significant
			MD	WBL	100	79	62	Less than significant
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	WBL	160	122	84	Significant unavoidable*
			PM	WBL	160	153	73	Significant unavoidable*
			MD	WBL	160	130	82	Significant unavoidable*
9	Sierra College Boulevard & I-80 WB Ramps	Caltrans	PM	SBT	370	Same results as Project Driveway Option 1A		
			MD	SBT	370	Same results as Project Driveway Option 1A		
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	Same results as Project Driveway Option 1A		
Project Driveway Option 1C								
1	Taylor Road & King Road	Loomis	MD	WBL	95	Same results as Project Driveway Option 1A		
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	WBL	160	Same results as Project Driveway Option 1B		
			PM	WBL	160	Same results as Project Driveway Option 1B		
			MD	WBL	160	Same results as Project Driveway Option 1B		
9	Sierra College Boulevard & I-80 WB Ramps	Caltrans	PM	SBT	370	Same results as Project Driveway Option 1A		
			MD	SBT	370	Same results as Project Driveway Option 1A		
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	Same results as Project Driveway Option 1A		

Notes:
NB: northbound, SB: southbound, EB: eastbound, WD: westbound, L: left turn lane, T: through lane, R: right turn lane
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction's ability to determine feasibility and implement.
Source: Kittelson & Associates, Inc. 2019

11.2 CUMULATIVE SHORT TERM PLUS PROJECT CONDITIONS

The following mitigation measures were evaluated to reduce the Project impacts to less than significant levels under CEQA. Initial evaluation of potential timing and phasing mitigations measures were not sufficient to address impacts. Geometric mitigation measures such as second through lanes and dual left turn lanes would be required to reduce impacts to less than significant levels. Table 65 presents the intersection mitigation measures under Cumulative Short Term plus Project Conditions.

Applying the mitigation measures identified in Table 65, intersection analysis was conducted. Table 66 presents the LOS results in comparison to no Project conditions and Table 67 outlines the queueing results. The mitigation measures would reduce the LOS and queue impacts to less than significant levels at some of the impacted locations; however, significant and unavoidable impacts remain as shown. Some impacts are deemed to be significant and unavoidable impacts because the respective intersections are located beyond the Town of Loomis (lead agency) jurisdiction.

Appendix “B” includes the level-of-service worksheets and Appendix “C” contains the queueing worksheets.

Table 65: Cumulative Short Term plus Project Mitigation Measures

ID	Intersection	Project Driveway Option(s) Requiring Mitigation	Jurisdiction	Impact Type	Current Traffic Control	Mitigation Measure	Specific Actions Recommended	Effects of Mitigation
2	Taylor Road & Horseshoe Bar Road	Options 1A, 1B, 1C	Loomis	Queue	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (90 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
6	Sierra College Boulevard & Taylor Road	Options 1A, 1B, 1C	Loomis	LOS/ Queue	Signal	TR MM 1: Modify signal timing TR MM 3: Modify signal phasing TR MM 7: Add storage to turn pockets	Provide eastbound right turn overlap phasing and optimize cycle length and splits (100 seconds for PM peak hour and 100 seconds for MD peak hour). Modify median to provide additional storage for northbound and westbound left turn lanes (Project to provide fairshare funding for modification to be implemented with the Town's Sierra College Boulevard roadway widening project between Taylor Road and Brace Road).	Provides right turn with green arrow allowing more vehicles to travel through the intersection. Creates longer turn pockets to hold more vehicles.
7	Sierra College Boulevard & Brace Road	Option 1B	Loomis	Queue	Signal	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Restripe the westbound right lane to a shared westbound left-right lane. Optimize cycle length and splits (75 seconds for PM peak hour and 65 seconds for MD peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
8	Sierra College Boulevard & Granite Drive	Option 1A	Rocklin	LOS/ Queue	Signal	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Restripe northbound right turn lane to shared through-right lane. Restripe the southbound right turn lane to a shared through-right lane. Provide eastbound right turn overlap phasing. Coordinate signal timing with I-80 ramps (120 seconds for AM peak hour, 135 seconds for PM peak hour and 130 seconds for MD peak hour)	Provides additional through lane, allowing more vehicles to travel through the intersection. Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
8	Sierra College Boulevard & Granite Drive	Options 1B, 1C	Rocklin	LOS/ Queue	Signal	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Restripe the southbound right turn lane to a shared through-right lane. Restripe westbound through lane to left turn and restripe westbound right turn lane to a shared through-right lane. Provide eastbound right turn overlap phasing. Coordinate signal timing with I-80 ramps (120	Provides additional through lane, allowing more vehicles to travel through the intersection. Provides additional left turn lane, allowing more vehicles to turn left during each signal
9	Sierra College Boulevard & I-80 WB Ramps	Options 1A, 1B, 1C	Caltrans	LOS/ Queue	Signal	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Provide an additional northbound left turn lane. Restripe westbound through-right lane to through lane and provide an additional westbound right turn lane. Optimize coordinated cycle lengths (120 seconds for AM, 136 seconds for PM and 130 seconds for MD peak hour)	Provides additional left turn lane, allowing more northbound vehicles to turn left during each signal phase. New right-turn lane allows for separation of through and right turn traffic, increasing capacity
15	Pacific St & Dominguez Rd-Delmar Ave	Options 1A, 1B, 1C	Rocklin	LOS	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (75 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
17	Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Rocklin	LOS/ Queue	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (105 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
24	Sierra College Boulevard & Project Driveway	Option 1A	Loomis	Queue	Signal	TR MM 1: Modify signal timing	Provide cycle length optimized for queues with optimized splits based on current demand (70 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
26	Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	Placer	LOS/Queue	TWSC	TR MM 6: Provide a traffic signal	Install a traffic signal.[1]	Provides protected time (stops major street) to facilitate minor street movements
27	Sierra College Boulevard & English Colony Way	Options 1A, 1B, 1C	Placer	LOS	TWSC	TR MM 6: Provide a traffic signal	Install a traffic signal.[1]	Provides protected time (stops major street to facilitate minor street movements
29	Taylor Road & English Colony Way	Options 1A, 1B, 1C	Placer	LOS	TWSC	TR MM 6: Provide a traffic signal.	Install a traffic signal.[1]	Provides protected time (stops major street) to facilitate minor street movements
31	Taylor Road & Penryn Road (South)	Options 1A, 1B, 1C	Placer	LOS	TWSC	TR MM 6: Provide a traffic signal.	Install a traffic signal. [1]	Provides protected time (stops major street) to facilitate minor street movements
36	Taylor Road & Webb Street	Options 1A, 1B, 1C	Loomis	LOS	TWSC	TR MM 4: Restripe Intersection	Eliminate 3 parking spaces on the north side of Webb Street and provide a 50 foot westbound right turn pocket.	Provides right turn lane, allowing these vehicles to move through intersection without waiting behind left/through vehicles

Notes:
[1] Traffic signal warrants met for impacted condition and provided in Appendix J.
Source: Kittelson & Associates, Inc. 2019

Table 66: Cumulative Short Term - Intersection LOS Analysis, Mitigation Results

ID	Intersection	Jurisdiction	Scenario	Short Term		Mitigated		Change in Delay (sec)	Impact with mitigation?
				Delay (sec)	LOS	Delay (sec)	LOS		
Project Driveway Option 1A									
6	Sierra College Boulevard & Taylor Road	Loomis	MD	31.7	C	33.4	C	1.7	Less than significant
8	Sierra College Boulevard & Granite Drive	Rocklin	PM	58.2	E	36.7	D	-25.1	Significant unavoidable*
			MD	39.9	D	42.0	D	2.1	Significant unavoidable*
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	PM	66.5	E	75.1	E	6.6	Significant unavoidable*
			MD	76.5	E	70.9	E	-5.6	Significant unavoidable*
15	Pacific St & Dominguez Rd-Delmar Ave	Rocklin	MD	32.1	C	31.8	C	-0.3	Significant unavoidable*
17	Granite Drive & Rocklin Road	Rocklin	MD	32.4	C	33.0	C	0.6	Significant unavoidable*
26	Sierra College Boulevard & SR-193	Placer	PM	79.4	F	15.2	B	-64.2	Significant unavoidable*
			MD	48.0	E	23.4	C	-24.6	Significant unavoidable*
27	Sierra College Boulevard & English Colony Way	Placer	PM	78.8	F	8.4	A	-70.4	Significant unavoidable*
			MD	25.5	D	5.0	A	-20.5	Significant unavoidable*
29	Taylor Road & English Colony Way	Placer	MD	24.8	C	8.6	A	-16.2	Significant unavoidable*
31	Taylor Road & Penryn Road (South)	Placer	AM	347.2	F	10.0	A	-337.2	Significant unavoidable*
36	Taylor Road & Webb Street	Loomis	MD	8006.9	F	52.9[1]	F	-7954.0	Less than significant
				9141.2[1]	F	52.9[1]	F	-9088.3	
Project Driveway Option 1B									
6	Sierra College Boulevard & Taylor Road	Loomis	MD	31.7	C	Same results as Project Driveway Option 1A			
8	Sierra College Boulevard & Granite Drive	Rocklin	PM	58.2	E	47.2	D	-11.0	Significant unavoidable*
			MD	39.9	D	31.6	C	-8.3	Significant unavoidable*
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	PM	66.5	E	54.6	D	-11.9	Significant unavoidable*
			MD	76.5	E	69.9	E	-6.6	Significant unavoidable*
15	Pacific St & Dominguez Rd-Delmar Ave	Rocklin	MD	32.1	C	Same results as Project Driveway Option 1A			
17	Granite Drive & Rocklin Road	Rocklin	MD	32.4	C	Same results as Project Driveway Option 1A			

ID	Intersection	Jurisdiction	Scenario	Short Term		Mitigated		Change in Delay (sec)	Impact with mitigation?
				Delay (sec)	LOS	Delay (sec)	LOS		
26	Sierra College Boulevard & SR-193	Placer	PM	79.4	F	Same results as Project Driveway Option 1A			
			MD	48.0	E	Same results as Project Driveway Option 1A			
27	Sierra College Boulevard & English Colony Way	Placer	PM	78.8	F	Same results as Project Driveway Option 1A			
			MD	25.5	D	Same results as Project Driveway Option 1A			
29	Taylor Road & English Colony Way	Placer	MD	24.8	C	Same results as Project Driveway Option 1A			
31	Taylor Road & Penryn Road (South)	Placer	AM	347.2	F	Same results as Project Driveway Option 1A			
36	Taylor Road & Webb Street	Loomis	MD	8006.9	F	Same results as Project Driveway Option 1A			
				9141.2[1]	F				
Project Driveway Option 1C									
6	Sierra College Boulevard & Taylor Road	Loomis	MD	31.7	C	Same results as Project Driveway Option 1A			
8	Sierra College Boulevard & Granite Drive	Rocklin	PM	58.2	E	Same results as Project Driveway Option 1B			
			MD	39.9	D	Same results as Project Driveway Option 1B			
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	PM	66.5	E	Same results as Project Driveway Option 1B			
			MD	76.5	E	Same results as Project Driveway Option 1B			
15	Pacific St & Dominguez Rd-Delmar Ave	Rocklin	MD	32.1	C	Same results as Project Driveway Option 1A			
17	Granite Drive & Rocklin Road	Rocklin	MD	32.4	C	Same results as Project Driveway Option 1A			
26	Sierra College Boulevard & SR-193	Placer	PM	79.4	F	Same results as Project Driveway Option 1A			
			MD	48.0	E	Same results as Project Driveway Option 1A			
27	Sierra College Boulevard & English Colony Way	Placer	PM	78.8	F	Same results as Project Driveway Option 1A			
			MD	25.5	D	Same results as Project Driveway Option 1A			
29	Taylor Road & English Colony Way	Placer	MD	24.8	C	Same results as Project Driveway Option 1A			
31	Taylor Road & Penryn Road (South)	Placer	AM	347.2	F	Same results as Project Driveway Option 1A			
36	Taylor Road & Webb Street	Loomis	MD	8006.9	F	Same results as Project Driveway Option 1A			

Notes:
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction's ability to determine feasibility and implement.
[1] Analysis run in HCS Software as the Synchro software was unable to assess the mitigation measure. The Short Term Baseline condition was also analyzed in HCS to provide a comparison.

Source: Kittelson & Associates, Inc. 2019

Table 67: Cumulative Short Term Plus Project - Intersection Queuing Analysis, Mitigation Results

ID	Intersection	Jurisdiction	Peak Hour	Movement	Storage (feet)	No Project Queue (feet)	Mitigated Queue (feet)	Impact with mitigation?
Project Driveway Option 1A								
2	Taylor Road & Horseshoe Bar Road	Loomis	MD	NBT	400	449	475	Significant unavoidable[1]
				SBT	380	367	423	Significant unavoidable[1]
6	Sierra College Boulevard & Taylor Rd	Loomis	PM	NBL	210	218	217	Less than significant[2]
			MD	NBL	210	206	254	Less than significant[2]
				WBL	215	269	290	Less than significant[2]
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	SBT	495	474	282	Significant unavoidable*
			PM	NBT	370	618	417	Significant unavoidable*
				SBT	495	817	806	Significant unavoidable*
			MD	NBT	370	432	326	Significant unavoidable*
				SBT	495	655	537	Significant unavoidable*
				EBL	185	236	234	Significant unavoidable*
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	AM	SBT	370	428	167	Significant unavoidable*[3]
			PM	SBT	370	868	749	Significant unavoidable*[3]
			MD	SBT	370	782	781	Significant unavoidable*[3]
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	353	351	Significant unavoidable*
24	Sierra College Boulevard & Project Driveway	Loomis	MD	SBL	190	-	181	Less than significant
26	Sierra College Boulevard & SR-193	Placer	MD	NBR	40	43	30	Significant unavoidable*
Project Driveway Option 1B								
2	Taylor Road & Horseshoe Bar Road	Loomis	MD	NBT	400	Same results as Project Driveway Option 1A		
				SBT	380	Same results as Project Driveway Option 1A		
6	Sierra College Boulevard & Taylor Rd	Loomis	PM	NBL	210	Same results as Project Driveway Option 1A		
			MD	NBL	210	Same results as Project Driveway Option 1A		
				WBL	215	Same results as Project Driveway Option 1A		
7	Sierra College Boulevard & Brace Road	Loomis	PM	SBL	170	148	148	Less than significant
			MD	WBL	100	140	100	Less than significant
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	SBT	495	474	358	Significant unavoidable*
				WBL	160	216	101	Significant unavoidable*

ID	Intersection	Jurisdiction	Peak Hour	Movement	Storage (feet)	No Project Queue (feet)	Mitigated Queue (feet)	Impact with mitigation?
			PM	NBT	370	618	217	Significant unavoidable*
				SBT	495	817	578	Significant unavoidable*
				WBL	160	163	102	Significant unavoidable*
			MD	NBT	370	432	259	Significant unavoidable*
				SBT	495	655	576	Significant unavoidable*
				EBL	185	236	228	Significant unavoidable*
				WBL	160	199	115	Significant unavoidable*
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	AM	SBT	370	428	143	Significant unavoidable*[3]
			PM	SBT	370	868	832	Significant unavoidable*[3]
			MD	SBT	370	782	782	Significant unavoidable*[3]
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	Same results as Project Driveway Option 1A		
Project Driveway Option 1C								
2	Taylor Road & Horseshoe Bar Road	Loomis	MD	NBT	400	Same results as Project Driveway Option 1A		
				SBT	380	Same results as Project Driveway Option 1A		
6	Sierra College Boulevard & Taylor Rd	Loomis	PM	NBL	210	Same results as Project Driveway Option 1A		
			MD	NBL	210	Same results as Project Driveway Option 1A		
				WBL	215	Same results as Project Driveway Option 1A		
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	SBT	495	Same results as Project Driveway Option 1B		
				WBL	160	Same results as Project Driveway Option 1B		
			PM	NBT	370	Same results as Project Driveway Option 1B		
				SBT	495	Same results as Project Driveway Option 1B		
				WBL	160	Same results as Project Driveway Option 1B		
			MD	NBT	370	Same results as Project Driveway Option 1B		
				SBT	495	Same results as Project Driveway Option 1B		
				EBL	185	Same results as Project Driveway Option 1B		
				WBL	160	Same results as Project Driveway Option 1B		
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	AM	SBT	370	Same results as Project Driveway Option 1B		
			PM	SBT	370	Same results as Project Driveway Option 1B		
			MD	SBT	370	Same results as Project Driveway Option 1B		
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	Same results as Project Driveway Option 1A		

Notes:
NB: northbound, SB: southbound, EB: eastbound, WD: westbound, L: left turn lane, T: through lane, R: right turn lane
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction's ability to determine feasibility and implement.
[1] The proposed mitigation does not reduce queues to No Project Conditions and additional geometric improvements are not feasible due to site constraints.
[2] Less than significant with 254 feet of storage provided for NBL and 290 feet of storage provided for WBL as mitigation measure.

[3] Note queuing analysis results at intersection impacted by changes at Sierra College Boulevard & Granite Drive intersection to the north that impact coordinated traffic signal timing and thus impact queuing.
Source: Kittelson & Associates, Inc. 2019

11.3 CUMULATIVE LONG TERM PLUS PROJECT CONDITIONS

The following mitigation measures were evaluated to reduce the Project impacts to less than significant levels under CEQA. Initial evaluation of potential timing and phasing mitigation measures were not sufficient to address impacts. Geometric mitigation measures such as second through lanes and dual left turn lanes would be required to reduce impacts to less than significant levels.

Table 68 presents the intersection mitigation measures under Cumulative Long Term plus Project Conditions.

The proposed mitigation measures were applied to the study intersections to evaluate LOS and queuing effects. Table 69 presents the LOS results in comparison to no Project conditions and Table 70 outlines the queueing results. The mitigation measures would reduce the LOS and queue impacts to less than significant levels at some of the impacted locations; however, significant and unavoidable impacts remain as shown. Some impacts are deemed to be significant and unavoidable impacts because the respective intersections are located beyond the Town of Loomis (lead agency) jurisdiction.

Appendix “B” includes the level-of-service worksheets and Appendix “C” contains the queueing worksheets.

Table 68: Cumulative Long Term plus Project Mitigation Measures

ID	Intersection	Project Driveway Option(s) Requiring Mitigation	Jurisdiction	Impact Type	Current Traffic Control	Mitigation Measure	Specific Actions Recommended	Effects of Mitigation
1	Taylor Road & King Road	Options 1A, 1B, 1C	Loomis	Queue	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (105 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
2	Taylor Road & Horseshoe Bar Road	Options 1A, 1B, 1C	Loomis	Queue	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (75 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
6	Sierra College Boulevard & Taylor Road	Options 1A, 1B, 1C	Loomis	LOS/ Queue	Signal	TR MM 1: Modify signal timing TR MM 3: Modify signal phasing TR MM 7: Add storage to turn pockets	Provide eastbound right turn overlap phasing and optimize cycle length and splits (120 seconds for PM peak hour and 100 seconds for MD peak hour). Modify median to provide additional storage for northbound and westbound left turn lanes (Project to provide fairshare funding for modification to be implemented with the Town's Sierra College Boulevard roadway widening project between Taylor Road and Brace Road)	Provides right turn with green arrow allowing more vehicles to travel through the intersection. Creates longer turn pockets to hold more vehicles.
7	Sierra College Boulevard & Brace Road	Option 1B	Loomis	Queue	Signal	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Restripe the westbound right lane to a shared westbound left-right lane. Optimize cycle length and splits (130 seconds for PM peak hour and 90 seconds for MD peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
8	Sierra College Boulevard & Granite Drive	Option 1A	Rocklin	LOS/ Queue	Signal	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Restripe northbound right turn lane to a shared through-right lane. Restripe eastbound right turn to shared through-right lane, restripe eastbound through lane to second left turn lane. Coordinate signal timing with I-80 ramps (145 seconds for AM peak hour, 150 seconds for PM peak hour, and 150 for MD peak hour)	Provides additional through and turn lane, allowing more vehicles to travel through the intersection. Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
8	Sierra College Boulevard & Granite Drive	Options 1B, 1C	Rocklin	Queue	Signal	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Restripe westbound through lane to left turn and restripe westbound right turn lane to a shared through-right lane. Provide eastbound right turn overlap phasing. Optimize cycle length and splits (145 seconds for AM peak hour and 115 for MD peak hour). Coordinate signal timing with I-80 ramps (150 seconds for PM peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
9	Sierra College Boulevard & I-80 WB Ramps	Option 1A	Caltrans	Queue	Signal	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes.	Provide an additional northbound left turn lane. Optimize coordinated cycle lengths (145 seconds for AM peak hour, 150 seconds for PM peak hour and 150 seconds for MD peak hour)*	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
9	Sierra College Boulevard & I-80 WB Ramps	Options 1B, 1C	Caltrans	Queue	Signal	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes.	Provide an additional northbound left turn lane. Optimize coordinated cycle lengths (145 seconds for AM peak hour, 150 seconds for PM peak hour and 126 seconds for MD peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
12	Sierra College Boulevard/ Bass Pro Dr-Dominguez Road	Options 1A, 1B, 1C	Rocklin	LOS	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (150 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
17	Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Rocklin	Queue	Signal	TR MM 1: Modify signal timing	Optimize cycle length and splits (110 seconds for MD peak hour)	Assigns green time to the highest demand movements allowing more vehicles to travel through the intersection
24	Sierra College Boulevard & Project Dwy	Option 1A	Loomis	Queue	Signal	TR MM 2: Provide signal coordination	Coordinate signal timing with Granite Drive and I-80 ramps (75 seconds for PM peak hour and 75 for MD peak hour)	Provides better progression through corridor
24	Sierra College Boulevard & Project Dwy	Options 1B, 1C	Loomis	Queue	Signal	TR MM 7: Add storage to turn pockets	Modify median to provide additional storage for southbound left turn lane (Project to implement with Sierra College Boulevard roadway widening along Project frontage).	Creates longer turn pockets to hold more vehicles
26	Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	Placer	LOS	Signal	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Provide an additional northbound left turn lane and optimize cycle lengths and splits (130 seconds for MD peak hour)	Provides additional left turn lane, allowing more vehicles to turn left during each signal phase
36	Taylor Road & Webb Street	Options 1A, 1B, 1C	Loomis	LOS	TWSC	TR MM 4: Restripe Intersection	Eliminate 3 parking spaces on the north side of Webb Street and provide a 50 foot westbound right turn pocket.	Provides right turn lane, allowing these vehicles to move through intersection without waiting behind left/through vehicles

Notes:
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction's ability to determine feasibility and implement. Note: queuing analysis results at intersection impacted by changes at Sierra College Boulevard & Granite Drive intersection to the north that impact coordinated traffic signal timing and thus impact queuing.
Source: Kittelson & Associates, Inc. 2019

Table 69: Cumulative Long Term - Intersection LOS Analysis, Mitigation Results

ID	Intersection	Jurisdiction	Scenario	Long Term		Mitigated		Change in Delay (sec)	Impact with mitigation?
				Delay (sec)	LOS	Delay (sec)	LOS		
Project Driveway Option 1A									
6	Sierra College Boulevard & Taylor Rd	Loomis	MD	33.2	C	35.0	C	1.8	Less than significant
8	Sierra College Boulevard & Granite Drive	Rocklin	PM	68.5	E	57.8	E	-10.7	Significant unavoidable*
12	Sierra College Boulevard/ Bass Pro Dr-Dominguez Road	Rocklin	MD	74.0	E	76.5	E	2.5	Significant unavoidable*
26	Sierra College Boulevard & SR-193	Placer	MD	186.1	F	71.1	E	-115.0	Significant unavoidable*
36	Taylor Road & Webb Street	Loomis	MD	435.6	F	428.9	F	-6.7	Less than significant
Project Driveway Option 1B									
6	Sierra College Boulevard & Taylor Rd	Loomis	MD	33.2	C	Same results as Project Driveway Option 1A			
12	Sierra College Boulevard/ Bass Pro Dr-Dominguez Road	Rocklin	MD	74.0	E	Same results as Project Driveway Option 1A			
26	Sierra College Boulevard & SR-193	Placer	MD	186.1	F	Same results as Project Driveway Option 1A			
36	Taylor Road & Webb Street	Loomis	MD	435.6	F	Same results as Project Driveway Option 1A			
Project Driveway Option 1C									
6	Sierra College Boulevard & Taylor Rd	Loomis	MD	33.2	C	Same results as Project Driveway Option 1A			
12	Sierra College Boulevard/ Bass Pro Dr-Dominguez Road	Rocklin	MD	74.0	E	Same results as Project Driveway Option 1A			
26	Sierra College Boulevard & SR-193	Placer	MD	186.1	F	Same results as Project Driveway Option 1A			
36	Taylor Road & Webb Street	Loomis	MD	435.6	F	Same results as Project Driveway Option 1A			

Notes:
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction's ability to determine feasibility and implement.
Source: Kittelson & Associates, Inc. 2019

Table 70: Cumulative Long Term Plus Project - Intersection Queuing Analysis, Mitigation Results

ID	Intersection	Jurisdiction	Peak Hour	Movement	Storage (feet)	No Project Queue (feet)	Mitigated Queue (feet)	Impact with mitigation?
Project Driveway Option 1A								
1	Taylor Road & King Road	Loomis	MD	WBL	95	110	110	Less than significant
2	Taylor Road & Horseshoe Bar Road	Loomis	MD	NBT	400	504	494	Less than significant
6	Sierra College Boulevard & Taylor Rd	Loomis	PM	NBL	210	217	214	Less than significant
			MD	NBL	210	205	203	Less than significant
				WBL	215	256	288	Less than significant[1]
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	NBT	365	285	205	Significant unavoidable*
				SBT	495	586	571	Significant unavoidable*
			PM	NBT	365	1078	616	Significant unavoidable*
				SBT	495	487	466	Significant unavoidable*
			MD	NBT	365	384	318	Significant unavoidable*
				SBT	495	260	416	Significant unavoidable*
				EBL	185	301	199	Significant unavoidable*
9	Sierra College Boulevard & I-80 WB Ramps	Caltrans	AM	SBT	370	803	863	Significant unavoidable[2]
			PM	SBT	370	874	750	Significant unavoidable*
			MD	SBT	370	595	166	Significant unavoidable*
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	419	395	Significant unavoidable*
24	Sierra College Boulevard & Project Dwy	Loomis	PM	SBL	190	-	123	Less than significant
			MD	SBL	190	-	182	Less than significant
Project Driveway Option 1B								
1	Taylor Road & King Road	Loomis	MD	WBL	95	Same results as Project Driveway Option 1A		
2	Taylor Road & Horseshoe Bar Road	Loomis	MD	NBT	400	Same results as Project Driveway Option 1A		
6	Sierra College Boulevard & Taylor Rd	Loomis	PM	NBL	210	Same results as Project Driveway Option 1A		
			MD	NBL	210	Same results as Project Driveway Option 1A		
				WBL	215	Same results as Project Driveway Option 1A		
7	Sierra College Boulevard & Brace Road	Loomis	PM	WBL	100	149	149	Less than significant
			MD	SBL	170	264	262	Less than significant

ID	Intersection	Jurisdiction	Peak Hour	Movement	Storage (feet)	No Project Queue (feet)	Mitigated Queue (feet)	Impact with mitigation?
				WBL	100	115	109	Less than significant
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	SBT	495	586	606	Significant unavoidable[2]
				WBL	160	263	135	Significant unavoidable*
			PM	NBT	365	1078	823	Significant unavoidable*
				SBT	495	487	694	Significant unavoidable[2]
				WBL	160	162	119	Significant unavoidable*
			MD	NBT	365	384	384	Significant unavoidable*
				WBL	160	138	96	Significant unavoidable*
9	Sierra College Boulevard & I-80 WB Ramps	Caltrans	AM	SBT	370	803	849	Significant unavoidable[2,3]
			PM	SBT	370	874	971	Significant unavoidable[2,3]
			MD	SBT	370	595	712	Significant unavoidable[2,3]
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	Same results as Project Driveway Option 1A		
24	Sierra College Boulevard & Project Dwy	Loomis	MD	SBL	190	-	207	Less than significant[4]
Project Driveway Option 1C								
1	Taylor Road & King Road	Loomis	MD	WBL	95	Same results as Project Driveway Option 1A		
2	Taylor Road & Horseshoe Bar Road	Loomis	MD	NBT	400	Same results as Project Driveway Option 1A		
6	Sierra College Boulevard & Taylor Rd	Loomis	PM	NBL	210	Same results as Project Driveway Option 1A		
			MD	NBL	210	Same results as Project Driveway Option 1A		
				WBL	215	Same results as Project Driveway Option 1A		
8	Sierra College Boulevard & Granite Drive	Rocklin	AM	SBT	495	Same results as Project Driveway Option 1B		
				WBL	160	Same results as Project Driveway Option 1B		
			PM	NBT	365	Same results as Project Driveway Option 1B		
				SBT	495	Same results as Project Driveway Option 1B		
				WBL	160	Same results as Project Driveway Option 1B		
			MD	NBT	365	Same results as Project Driveway Option 1B		
				WBL	160	Same results as Project Driveway Option 1B		
9	Sierra College Boulevard & I-80 WB Ramps	Caltrans	AM	SBT	370	Same results as Project Driveway Option 1B		
			PM	SBT	370	Same results as Project Driveway Option 1B		
			MD	SBT	370	Same results as Project Driveway Option 1B		
17	Granite Drive & Rocklin Road	Rocklin	MD	EBL	225	Same results as Project Driveway Option 1A		
24	Sierra College Boulevard & Project Dwy	Loomis	PM	SBL	190	Same results as Project Driveway Option 1A		

ID	Intersection	Jurisdiction	Peak Hour	Movement	Storage (feet)	No Project Queue (feet)	Mitigated Queue (feet)	Impact with mitigation?
			MD	SBL	190	Same results as Project Driveway Option 1A		

NB: northbound, SB: southbound, EB: eastbound, WD: westbound, L: left turn lane, T: through lane, R: right turn lane
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures are outside of the lead agency jurisdiction's ability to determine feasibility and implement.
[1] Less than significant with 288 feet of storage provided for WBL as mitigation measure for Option 1A and 356 for Option 1B.
[2] The impact could not be mitigated to less than significant levels. A fourth southbound through lane may be needed to accommodate traffic volumes.
[3] Note queuing analysis results at intersection impacted by changes at Sierra College Boulevard & Granite Drive intersection to the north that impact coordinated traffic signal timing and thus impact queuing.
[4] Less than significant with 207 feet of storage provided for SBL.
Source: Kittelson & Associates, Inc. 2019

11.4 SECONDARY IMPACTS OF MITIGATION MEASURES

The LOS and queue mitigation measures proposed to reduce the Project impacts to less than significant levels could potentially trigger additional LOS and queue impacts. The LOS and queue outputs for each mitigated intersection were reviewed to ensure that additional Project impacts did not occur after the mitigation measures were in place. The output sheets are provided in Appendix "B" for LOS and Appendix "C" for queueing. No additional impacts were found with the implementation of mitigation measures.

11.5 EMPLOYEE TRANSPORTATION DEMAND MANAGEMENT PROGRAM

Costco proposes to develop and implement an employee Transportation Demand Management (TDM) program at the Loomis site. The TDM program will seek to reduce peak period single-occupancy vehicle trips that would otherwise be made by site employees[18]. The TDM program will identify measures that encourage Costco employees to use alternatives to driving alone when traveling to and from work.

Key elements of the Loomis site TDM Program plan are expected to include[19]:

- use of a staggered shift operation, scheduling employee shift changes outside of the typical commuter peak time periods (7:00 to 9:00 AM and 4:00 to 6:00 PM)
- encouraging ride sharing in the form of employee carpools and vanpools
- an on-site employee transportation coordinator (ETC) who can assist and be responsible for promoting, facilitating, and coordinating carpools and vanpools for employees with similar shift patterns
- an employee orientation program addressing commuting options
- potential incentives encouraging employee participation in a rideshare program

[18] The nature of the Costco operations (i.e., bulk purchasing, business wholesale shopping, and fueling) necessitate vehicular travel by Costco members due to the need for vehicles to transport the goods and fuel purchased. This is consistent with other retail uses in that the retailer has little or no control over how and/or when customers travel to and from the subject site.

[19] Note that Costco employee use of Placer County Transit service to commute to and from the Project site is not included in the TDM program elements at this time based on the current lack of frequent transit service within a ¼ mile walking distance of the Project site as well as the shift times of Costco employees not being well served by current transit opportunities. Future incorporation of a transit element to the TDM program could be considered if future Placer County Transit service opportunities are located closer to the Project site and service times/frequency would better support Project site employee commuting.

- encouraging bicycling and walking as viable commute options, including provision of bicycle racks and employee lockers for storage of change clothing and personal items to provide more convenience to bicycle and walking commuters
- an employee kitchen and café/deli services on site that are available to employees within the Costco warehouse, reducing the need for employees to travel off site for meals and/or break periods

Section 12 Conclusions and Recommendations

12.0 CONCLUSIONS

The results of the traffic impact analysis indicate that the proposed Project would impact traffic operations and require appropriate mitigations to address the impacts. The proposed mitigation measures would not reduce Project impacts to less than significant levels under CEQA therefore significant unavoidable impacts remain.

12.1 FINDINGS

Based on the analysis methodology and significance criteria approved by the Town, Table 71 lists the study intersections performing at unacceptable level-of-service (LOS) as well as locations impacted by the Project. Table 72 lists the study intersections where queues extend beyond the available storage lengths as well as locations impacted by the Project.

The following assumptions were applied to the study conditions.

12.1.1 Project Development Plan

The proposed development was estimated to generate 4,330 daily net new trips; 130 net new trips (65 inbound, 65 outbound) were projected to occur during the weekday AM peak hour; 391 net new trips (190 inbound, 201 outbound) were projected to occur during the weekday PM peak hour and 766 net new trips (391 inbound, 375 outbound) were projected to occur during the weekend midday peak hour.

Costco will provide the following transportation infrastructure in conjunction with site development.

- Sierra College Boulevard Changes
  - Restripe the existing northbound right-turn lane on Sierra College Boulevard approaching Granite Drive from an exclusive right-turn lane to a shared through/right-turn lane (for Project Driveway Options 1B and 1C only).
  - Dedicate right-of-way and widen Sierra College Boulevard along the Project site frontage and restripe the roadway to provide three northbound through travel lanes and a northbound Class II bicycle lane between Granite Drive and Brace Road.
  - Signalize the proposed new Costco site access intersection on Sierra College Boulevard.
  - Provide traffic signal interconnect between the proposed new Costco site access signalized intersection and the adjacent intersections along Sierra College Boulevard at Brace Road and Granite Drive.
  - Construct a separate northbound right-turn lane on Sierra College Boulevard approaching the proposed new signalized site access intersection. Provide a right-turn overlap signal phase at the intersection.

    - Construct a southbound left-turn lane on Sierra College Boulevard approaching the proposed new signalized Costco site access intersection.
    - Construct a separate northbound right-turn lane on Sierra College Boulevard approaching the signalized Brace Road intersection (the turn lane is proposed to include a 90-foot long taper and 200 feet of right-turn storage). Provide a right-turn overlap signal phase at the intersection.

- Brace Road
    - Dedicate right-of-way and construct standard half-street improvements along the Brace Road site frontage.
    - Install a raised median on Brace Road between Sierra College Boulevard and the existing Homewood Lumber driveway to the east to limit Costco access to right-turns only.
- Granite Drive (for Project Driveway Options 1B and 1C only)
    - Reconstruct Granite Drive east of Sierra College Boulevard to provide side-by-side eastbound and westbound left-turn lanes separated by a new raised median between Sierra College Boulevard and the new north-south drive aisle to the Costco Project site (including widening east of the existing private driveways on Granite Drive to accommodate the side-by-side left-turn lane).

12.1.2 Cumulative Short Term Traffic Conditions

No background improvements were assumed on the transportation network with the exception of approved/pending project access to the existing roadway network.

12.1.3 Cumulative Long Term Traffic Conditions

The following roadway improvements were assumed under 2030 conditions:

- Sierra College Boulevard: widened to 5-6 lanes from Taylor Road to south of Rocklin Road (includes assumed southbound frontage improvements along the currently vacant commercial property west of Sierra College Boulevard between Granite Drive and Brace Road and only 2 northbound lanes between Granite Drive and Brace Road)
- Sierra College Boulevard & Highway 193 intersection signalization
- Sierra College Boulevard & English Colony Way intersection signalization
- Sierra College Boulevard & Delmar Avenue intersection signalization
- Taylor Road & Penryn Road intersection signalization
- Taylor Road & English Colony Way intersection signalization

- Pacific Street: widened to 4 lanes from Town of Loomis boundary line to Delmar Avenue/Dominguez Road
- Rocklin Road: widened to 6 lanes from east of Granite Drive (not improved at Granite Drive) to west of Sierra College Boulevard; widened to 4 lanes east of Sierra College Boulevard
- Dominguez Road extension from Granite Drive to Sierra College Boulevard: 2 lanes provided (including signalization of the Granite Drive & Dominguez Road intersection)

12.1.4 On-Site Circulation/Site Access Operations

All but one of the access points would function acceptably with the proposed geometry and control. In the Cumulative Long-term With Project condition, the southbound left turn at the signalized Sierra College Boulevard Project driveway requires 17 feet of additional storage under all Project driveway options. The additional southbound left-turn storage is expected to be required in the future in conjunction with installation of a third southbound through lane on Sierra College Boulevard which will result the shortening of the off-site northbound left-turn lane serving property on the west side of Sierra College Boulevard. The existing left-turn pocket is approximately 95 feet long and experiences queues of 20 feet or less during all analysis scenarios.

12.1.5 CEQA Conclusions Summary

Based on the mitigation measures proposed in Section 11, Table 73 outlines the CEQA conclusion for each impacted study location. Please note that mitigation measures outside of the lead agency jurisdiction to determine feasibility based on location and subsequently implement are considered significant and unavoidable.

Table 71: Study Area Intersection LOS Results Summary

ID	Intersection	Jurisdiction	Existing Conditions				Cumulative Short Term Conditions				Cumulative Long Term Conditions			
			Unacceptable LOS?		Project Impact?	Significance after Mitigation?	Unacceptable LOS?		Project Impact?	Significance after Mitigation?	Unacceptable LOS?		Project Impact?	Significance after Mitigation?
			Existing	Existing + Project			Short Term	Short Term + Project			Long Term	Long Term + Project		
1	Taylor Road & King Road	Loomis	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
2	Taylor Road & Horseshoe Bar Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
3	Horseshoe Bar Road & I-80 Westbound Ramp	Caltrans	-	-	-	-	-	-	-	-	-	-	-	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
5	Barton Road & Brace Road	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
6	Sierra College Boulevard & Taylor Road	Loomis	Yes	Yes	-	-	Yes	Yes	Yes	LTS	Yes	Yes	Yes	LTS
7	Sierra College Boulevard & Brace Road	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
8	Sierra College Boulevard & Granite Drive	Rocklin	-	-	-	-	Yes	Yes	Yes	SU	Yes	Yes	Yes[1]	SU
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	-	-	-	-	-	Yes	Yes	SU	-	-	-	-
10	Sierra College Boulevard & I-80 Eastbound Ramps	Caltrans	-	-	-	-	-	-	-	-	-	-	-	-
11	Sierra College Boulevard & Schriber Way	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
12	Sierra College Boulevard & Bass Pro Drive-Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	Yes	SU
13	Sierra College Boulevard & Stadium Driveway	Rocklin	-	-	-	-	-	-	-	-	-	-	-	-
14	Sierra College Boulevard & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
15	Pacific Street & Dominguez Road-Delmar Avenue	Rocklin	Yes	Yes	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
16	Pacific Street & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
17	Granite Drive & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
18	I-80 Westbound Ramps & Rocklin Road	Caltrans	-	-	-	-	-	-	-	-	Yes	Yes	-	-
19	I-80 Eastbound Ramps & Rocklin Road	Caltrans	-	-	-	-	-	-	-	-	Yes	Yes	-	-
20	Aguilar Road & Rocklin Road	Rocklin	-	-	-	-	-	-	-	-	-	-	-	-
21	Sierra College Boulevard & Driveway South of Brace Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
22	Granite Drive & Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
23	El Don Drive & Rocklin Road	Rocklin	Yes	Yes	-	-	-	-	-	-	Yes	Yes	-	-
24	Sierra College Boulevard & Project Driveway – Future West Access by	Loomis	DNE	-	-	-	DNE	-	-	-	Yes	-	-	-
25	Brace Road & Project Driveway	Loomis	DNE	-	-	-	DNE	-	-	-	DNE	-	-	-
26	Sierra College Boulevard & SR-193	Placer	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
27	Sierra College Boulevard & English Colony Way	Placer	-	-	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
28	Sierra College Boulevard & Delmar Avenue	Placer	Yes	Yes	-	-	Yes	Yes	-	-	-	-	-	-
29	Taylor Road & English Colony Way	Placer	-	-	-	-	-	Yes	Yes	SU	Yes	Yes	-	-
30	Taylor Road & Penryn Road (North)	Placer	-	-	-	-	-	-	-	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	Placer	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	-	-	-	-
32	Taylor Road & Del Oro High School North Lot	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
33	Taylor Road & Del Oro High School Drop-Off	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
34	Taylor Road & Del Oro High School South Lot	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
35	Taylor Road & Rippey Road	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
36	Taylor Road & Webb Street	Loomis	Yes	Yes	Yes	SU	Yes	Yes	Yes	LTS	Yes	Yes	Yes	LTS
37	Brace Road & Project Driveway East	Loomis	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Project Impacts apply to all Project Driveway Options unless otherwise noted: 1: Under Project Driveway Option 1A only. 2: Under Project Driveway Option 1B only. 3: Under Project Driveway Option 1C only.

SU: Significant and Unavoidable Impact. LTS: Less Than Significant Impact DNE: Intersection does not exist under no Project conditions.

Source: Kittelson & Associates, 2019

Table 72: Study Area Queuing Results Summary

ID	Intersection	Jurisdiction	Existing Conditions				Cumulative Short Term Conditions				Cumulative Long Term Conditions			
			95th Percentile Queue>Storage?		Project Impact?	Significance after Mitigation?	95th Percentile Queue>Storage?		Project Impact?	Significance after Mitigation?	95th Percentile Queue>Storage?		Project Impact?	Significance after Mitigation?
			Existing	Existing + Project			Short Term	Short Term + Project			Long Term	Long Term + Project		
1	Taylor Road & King Road	Loomis	Yes	Yes	Yes	LTS	Yes	Yes	-	-	Yes	Yes	Yes	LTS
2	Taylor Road & Horseshoe Bar Road	Loomis	Yes	Yes	-	-	Yes	Yes	Yes	SU	Yes	Yes	Yes	LTS
3	Horseshoe Bar Road & I-80 Westbound Ramp	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	Caltrans	-	-	-	-	-	-	-	-	Yes	Yes	-	-
5	Barton Road & Brace Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
6	Sierra College Boulevard & Taylor Road	Loomis	Yes	Yes	-	-	Yes	Yes	Yes	LTS	Yes	Yes	Yes	LTS
7	Sierra College Boulevard & Brace Road	Loomis	-	Yes	Yes[2]	LTS	Yes	Yes	Yes[2]	LTS	Yes	Yes	Yes[2]	LTS
8	Sierra College Boulevard & Granite Drive	Rocklin	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
9	Sierra College Boulevard & I-80 Westbound Ramps	Caltrans	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
10	Sierra College Boulevard & I-80 Eastbound Ramps	Caltrans	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
11	Sierra College Boulevard & Schriber Way	Rocklin	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
12	Sierra College Boulevard & Bass Pro Drive-Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
13	Sierra College Boulevard & Stadium Driveway	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
14	Sierra College Boulevard & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
15	Pacific Street & Dominguez Road-Delmar Avenue	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
16	Pacific Street & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
17	Granite Drive & Rocklin Road	Rocklin	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU	Yes	Yes	Yes	SU
18	I-80 Westbound Ramps & Rocklin Road	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
19	I-80 Eastbound Ramps & Rocklin Road	Caltrans	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
20	Aguilar Road & Rocklin Road	Rocklin	-	-	-	-	Yes	Yes	-	-	Yes	Yes	-	-
21	Sierra College Boulevard & Driveway South of Brace Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
22	Granite Drive & Dominguez Road	Rocklin	-	-	-	-	-	-	-	-	Yes	Yes	-	-
23	El Don Drive & Rocklin Road	Rocklin	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
24	Sierra College Boulevard & Project Driveway – Future West Access by Others	Loomis	DNE	-	-	-	DNE	Yes	Yes	LTS	Yes	Yes	Yes	LTS
25	Brace Road & Project Driveway	Loomis	DNE	-	-	-	DNE	-	-	-	DNE	-	-	-
26	Sierra College Boulevard & SR-193	Placer	-	-	-	-	Yes	Yes	Yes	SU	Yes	Yes	-	-
27	Sierra College Boulevard & English Colony Way	Placer	-	-	-	-	-	-	-	-	Yes	Yes	-	-
28	Sierra College Boulevard & Delmar Avenue	Placer	-	-	-	-	-	-	-	-	-	-	-	-
29	Taylor Road & English Colony Way	Placer	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
30	Taylor Road & Penryn Road (North)	Placer	-	-	-	-	-	-	-	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	Placer	-	-	-	-	-	-	-	-	Yes	Yes	-	-
32	Taylor Road & Del Oro High School North Lot	Loomis	-	-	-	-	-	-	-	-	Yes	Yes	-	-
33	Taylor Road & Del Oro High School Drop-Off	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
34	Taylor Road & Del Oro High School South Lot	Loomis	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
35	Taylor Road & Rippey Road	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
36	Taylor Road & Webb Street	Loomis	-	-	-	-	-	-	-	-	-	-	-	-
37	Brace Road & Project Driveway East	Loomis	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Project Impacts apply to all Project Driveway Options unless otherwise noted: 1: Under Project Driveway Option 1A only. 2: Under Project Driveway Option 1B only. 3: Under Project Driveway Option 1C only.

SU: Significant and Unavoidable Impact. LTS: Less Than Significant Impact DNE: Intersection does not exist under no Project conditions.

Source: Kittelson & Associates, 2019

Table 73: CEQA Conclusions Summary

Intersection	Project Driveway Option(s) Requiring Mitigation	Type of Impact	Jurisdiction	Mitigation Measure	Significance After Mitigation
Existing plus Project Conditions					
1: Taylor Road & King Road	Options 1A, 1B, 1C	Queue (WBL)	Loomis	TR MM 1: Modify signal timing	Less than significant
7: Sierra College Boulevard & Brace Road	Option 1B	Queue (WBL)	Loomis	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Less than significant
8: Sierra College Boulevard & Granite Drive	Option 1A	Queue (NBT, SBT, EBL)	Rocklin	TR MM 1: Modify signal timing TR MM 4: Restripe intersection	Significant unavoidable*
8: Sierra College Boulevard & Granite Drive	Options 1B, 1C	Queue (WBL)	Rocklin	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Significant unavoidable*
9: Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	Queue (SBT)	Caltrans	TR MM 1: Modify signal timing	Significant unavoidable*
17: Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Queue (EBL)	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
26: Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
31: Taylor Road & Penryn Road (South)	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
36: Taylor Road & Webb Street	Options 1A, 1B, 1C	LOS	Loomis	TR MM 4: Restripe intersection	Significant unavoidable[1]
Cumulative Short Term plus Project Conditions					
2: Taylor Road & Horseshoe Bar Road	Options 1A, 1B, 1C	Queue (NBT, SBT)	Loomis	TR MM 1: Modify signal timing	Significant unavoidable[2]
6: Sierra College Boulevard & Taylor Road	Options 1A, 1B, 1C	LOS	Loomis	TR MM 1: Modify signal timing TR MM 3: Modify signal phasing TR MM 7: Add storage to turn pockets	Less than significant
		Queue (NBL, WBL)			Less than significant
7: Sierra College Boulevard & Brace Road	Option 1B	Queue (SBL, WBL)	Loomis	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Less than significant
8: Sierra College Boulevard & Granite Drive	Option 1A	Queue (NBT, SBT, EBL)	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe intersection	Significant unavoidable*

Intersection	Project Driveway Option(s) Requiring Mitigation	Type of Impact	Jurisdiction	Mitigation Measure	Significance After Mitigation
8: Sierra College Boulevard & Granite Drive	Options 1B, 1C	LOS	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Significant unavoidable*
		Queue (NBT, SBT, EBL, WBL)			Significant unavoidable*
9: Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	LOS	Caltrans	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Significant unavoidable*
		Queue (SBT)			Significant unavoidable*
15: Pacific Street & Dominguez Road-Delmar Avenue	Options 1A, 1B, 1C	LOS	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
17: Granite Drive & Rocklin Road	Options 1A, 1B, 1C	LOS/Queue (EBL)	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
24: Sierra College Boulevard & Project Driveway	Option 1A	Queue (SBL)	Loomis	TR MM 1: Modify signal timing	Less than significant
26: Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	LOS/Queue (NBR)	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
27: Sierra College Boulevard & English Colony Way	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
29: Taylor Road & English Colony Way	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
31: Taylor Road & Penryn Road (South)	Options 1A, 1B, 1C	LOS	Placer	TR MM 6: Provide a traffic signal	Significant unavoidable*
36: Taylor Road & Webb Street	Options 1A, 1B, 1C	LOS	Loomis	TR MM 4: Restripe Intersection	Less than significant
Cumulative Long Term plus Project Conditions					
1: Taylor Road & King Road	Options 1A, 1B, 1C	Queue (WBL)	Loomis	TR MM 1: Modify signal timing	Less than significant
2: Taylor Road & Horseshoe Bar Road	Options 1A, 1B, 1C	Queue (NBT)	Loomis	TR MM 1: Modify signal timing	Less than significant
6: Sierra College Boulevard & Taylor Road	Options 1A, 1B, 1C	LOS	Loomis	TR MM 1: Modify signal timing TR MM 3: Modify signal phasing	Less than significant
		Queue (NBL, WBL)			Less than significant
7: Sierra College Boulevard & Brace Road	Option 1B	Queue (SBL, WBL)	Loomis	TR MM 1: Modify signal timing TR MM 4: Restripe Intersection	Less than significant
8: Sierra College Boulevard & Granite Drive	Option 1A	LOS	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Significant unavoidable*
		Queue (NBT, SBT, EBL)			

Intersection	Project Driveway Option(s) Requiring Mitigation	Type of Impact	Jurisdiction	Mitigation Measure	Significance After Mitigation
8: Sierra College Boulevard & Granite Drive	Options 1B, 1C	Queue (NBT, SBT, WBL)	Rocklin	TR MM 2: Provide signal coordination TR MM 4: Restripe Intersection	Significant unavoidable*
9: Sierra College Boulevard & I-80 Westbound Ramps	Options 1A, 1B, 1C	Queue (SBT)	Caltrans	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Significant unavoidable[3]
17: Granite Drive & Rocklin Road	Options 1A, 1B, 1C	Queue (EBL)	Rocklin	TR MM 1: Modify signal timing	Significant unavoidable*
24: Sierra College Boulevard & Project Driveway	Option 1A	Queue (SBL)	Loomis	TR MM 2: Provide signal coordination	Less than significant
24: Sierra College Boulevard & Project Driveway	Options 1B, 1C	Queue (SBL)	Loomis	TR MM 7: Add storage to turn pockets	Less than significant
26: Sierra College Boulevard & SR-193	Options 1A, 1B, 1C	LOS	Placer	TR MM 1: Modify signal timing TR MM 5: Add exclusive turn lanes	Significant unavoidable*
36: Taylor Road & Webb Street	Options 1A, 1B, 1C	LOS	Loomis	TR MM 4: Restripe Intersection	Less than significant

Notes:
NB: northbound, SB: southbound, EB: eastbound, WD: westbound, L: left turn lane, T: through lane, R: right turn lane
*Though the mitigation measure improves the intersection operation to less than significant levels, the mitigation measures may be deemed infeasible or outside of the lead agency jurisdiction to implement.
[1]Temporary impact given this impact can be mitigated with the westbound right-turn mitigation measure under Short Term and Long Term conditions. Traffic volumes projected at intersection do not meet signal traffic warrants.

[2]The proposed mitigation does not reduce queues to No Project Conditions and additional geometric improvements are not feasible due to site constraints.

[3] The impact could not be mitigated to less than significant levels. A fourth southbound through lane may be needed to accommodate traffic volumes. The mitigation measures may be deemed infeasible or outside of the lead agency jurisdiction to implement.
Source: Kittelson & Associates, Inc. 2019

Appendix A: Traffic Count Data

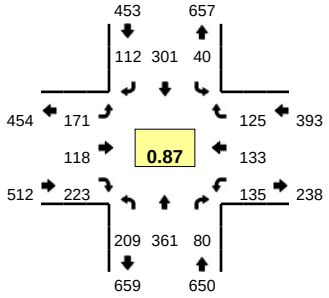
Type of peak hour being reported: Intersection Peak

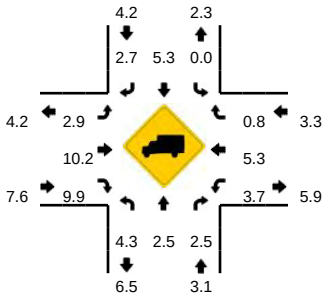
Method for determining peak hour: Total Entering Volume

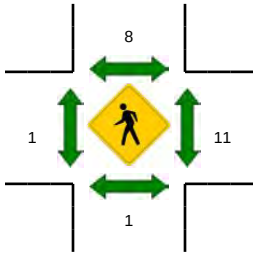
LOCATION: Taylor Rd -- King Rd
CITY/STATE: Placer, CA

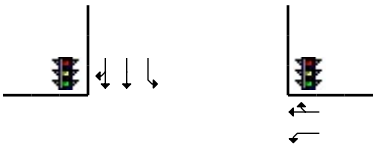
QC JOB #: 13963315
DATE: Wed, Nov 30 2016

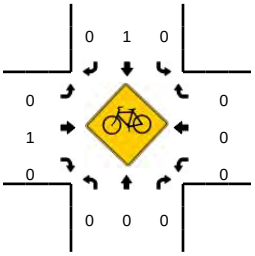
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

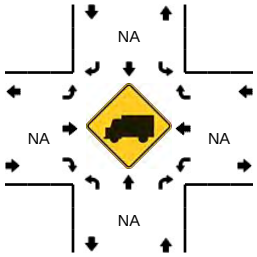


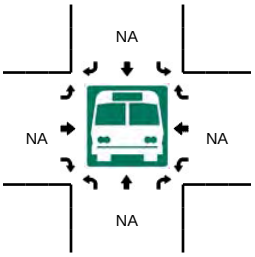












5-Min Count Period Beginning At	Taylor Rd (Northbound)				Taylor Rd (Southbound)				King Rd (Eastbound)				King Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	32	11	6	0	1	12	4	0	9	4	13	0	4	8	5	0	109	
7:05 AM	14	15	6	0	3	6	3	0	6	9	16	0	12	10	3	0	103	
7:10 AM	16	36	8	0	1	17	2	0	13	3	14	0	5	10	8	0	133	
7:15 AM	17	32	6	0	2	25	5	0	14	7	14	0	6	8	11	0	147	
7:20 AM	14	37	3	0	4	25	12	0	25	3	20	0	5	6	17	0	171	
7:25 AM	10	47	4	0	4	29	12	0	27	9	10	0	1	8	11	0	172	
7:30 AM	11	52	6	0	2	26	5	0	26	9	12	0	12	10	22	0	193	
7:35 AM	8	50	3	0	3	36	12	0	18	8	17	0	11	4	19	0	189	
7:40 AM	13	28	4	0	5	35	11	0	18	8	14	0	17	16	23	0	192	
7:45 AM	11	48	7	0	7	32	8	0	13	7	23	0	14	14	15	0	199	
7:50 AM	19	13	7	0	7	46	17	0	8	12	15	0	8	10	1	0	163	
7:55 AM	25	11	6	0	2	20	15	0	6	13	30	0	13	14	1	0	156	1927
8:00 AM	30	13	10	0	0	7	6	0	8	15	15	0	16	12	1	0	133	1951
8:05 AM	32	18	12	0	1	13	2	0	4	11	24	0	13	21	1	0	152	2000
8:10 AM	19	12	12	0	3	7	7	0	4	16	29	0	19	10	3	0	141	2008
8:15 AM	22	18	13	0	1	10	4	0	4	12	30	0	14	9	3	0	140	2001
8:20 AM	24	16	7	0	2	21	4	0	3	11	31	0	22	9	0	0	150	1980
8:25 AM	29	21	23	0	2	22	1	0	8	9	29	0	11	8	4	0	167	1975
8:30 AM	18	13	14	0	1	11	4	0	0	7	15	0	14	4	2	0	103	1885
8:35 AM	19	12	6	0	0	9	10	0	4	6	17	0	8	5	2	0	98	1794
8:40 AM	16	7	5	0	0	14	0	0	1	6	19	0	10	3	0	0	81	1683
8:45 AM	12	3	7	0	0	14	2	0	1	8	14	0	4	1	1	0	67	1551
8:50 AM	18	12	4	0	2	11	2	0	8	7	11	0	8	1	4	0	88	1476
8:55 AM	15	13	10	0	0	13	3	0	5	7	20	0	7	3	1	0	97	1417

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	128	504	56	0	60	412	124	0	196	92	216	0	168	136	228	0	2320
Heavy Trucks	8	8	0		0	8	0		0	8	32		4	4	0		72
Pedestrians		0				8				4				4			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

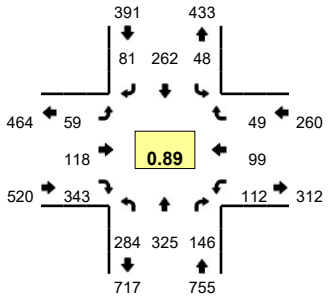
Type of peak hour being reported: Intersection Peak

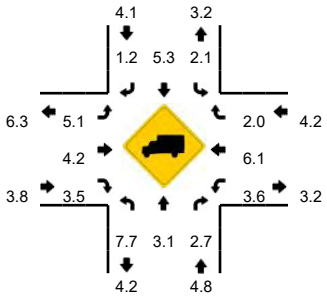
Method for determining peak hour: Total Entering Volume

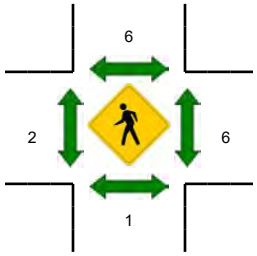
LOCATION: Taylor Rd -- King Rd
CITY/STATE: Placer, CA

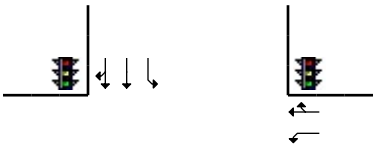
QC JOB #: 13963316
DATE: Wed, Nov 30 2016

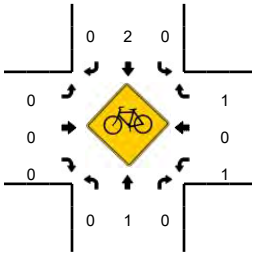
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

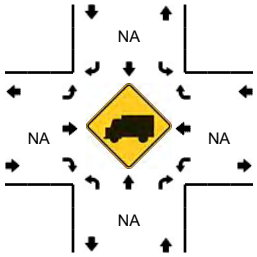


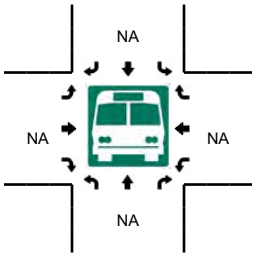












5-Min Count Period Beginning At	Taylor Rd (Northbound)				Taylor Rd (Southbound)				King Rd (Eastbound)				King Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	37	15	15	0	7	27	4	0	4	9	22	0	10	7	8	0	165	
4:05 PM	27	32	11	0	4	21	9	0	11	11	34	0	5	9	4	0	178	
4:10 PM	18	30	8	0	10	21	4	0	6	12	34	0	10	10	2	0	165	
4:15 PM	26	28	11	0	3	21	9	0	3	7	24	0	9	6	3	0	150	
4:20 PM	29	34	13	0	0	19	6	0	3	7	12	0	10	8	5	0	146	
4:25 PM	30	25	13	0	1	13	11	0	7	10	21	0	16	12	7	0	166	
4:30 PM	26	25	9	0	4	19	8	0	4	8	46	0	6	5	4	0	164	
4:35 PM	17	33	8	0	6	35	8	0	6	12	38	0	19	5	4	0	191	
4:40 PM	25	38	12	0	3	26	7	0	2	16	34	0	9	11	4	0	187	
4:45 PM	19	23	14	0	4	23	4	0	5	10	26	0	6	11	3	0	148	
4:50 PM	14	24	16	0	4	16	6	0	6	14	32	0	7	10	0	0	149	
4:55 PM	16	18	16	0	2	21	5	0	2	2	20	0	5	5	5	0	117	1926
5:00 PM	22	23	12	0	0	14	5	0	7	10	32	0	11	3	3	0	142	1903
5:05 PM	25	32	14	0	2	17	5	0	1	2	28	0	11	11	2	0	150	1875
5:10 PM	21	14	15	0	5	22	6	0	9	6	25	0	12	4	3	0	142	1852
5:15 PM	17	25	16	0	3	13	7	0	2	9	26	0	14	11	0	0	143	1845
5:20 PM	24	23	10	0	1	18	3	0	2	2	20	0	3	6	4	0	116	1815
5:25 PM	15	23	16	0	0	17	3	0	4	5	20	0	7	10	1	0	121	1770
5:30 PM	18	22	8	0	0	12	3	0	11	12	30	0	6	12	2	0	136	1742
5:35 PM	38	40	13	0	1	16	5	0	4	10	35	0	8	6	1	0	177	1728
5:40 PM	14	30	19	0	1	25	5	0	9	7	37	0	2	9	6	0	164	1705
5:45 PM	28	28	3	0	3	23	2	0	4	9	17	0	7	2	3	0	129	1686
5:50 PM	23	37	8	0	4	19	8	0	6	5	18	0	5	7	2	0	142	1679
5:55 PM	20	19	16	0	3	9	7	0	8	4	9	0	7	3	3	0	108	1670

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	272	384	116	0	52	320	92	0	48	144	472	0	136	84	48	0	2168
Heavy Trucks	24	24	0		0	16	4		0	8	16		12	8	0		112
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

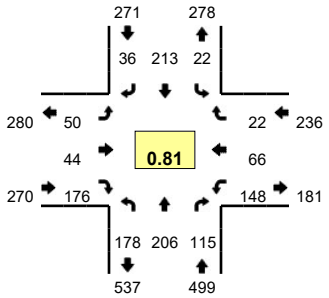
Type of peak hour being reported: Intersection Peak

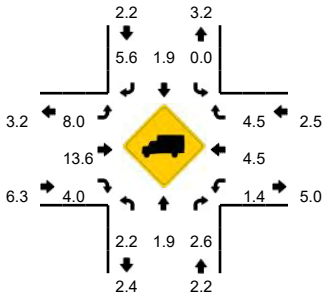
Method for determining peak hour: Total Entering Volume

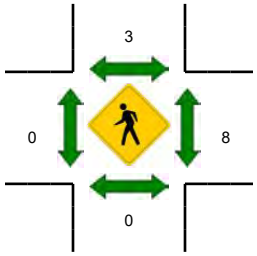
LOCATION: B1 - Taylor†Rd -- King†Rd
CITY/STATE: Placer, CA

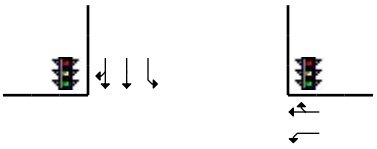
QC JOB #: 14088508
DATE: Sat, Jan 28 2017

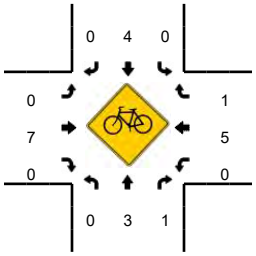
Peak-Hour: 11:30 AM -- 12:30 PM
Peak 15-Min: 12:05 PM -- 12:20 PM

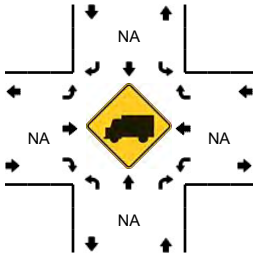


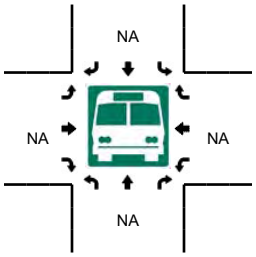












5-Min Count Period Beginning At	B1 - Taylor†Rd (Northbound)				B1 - Taylor†Rd (Southbound)				King†Rd (Eastbound)				King†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	16	14	10	0	3	17	4	0	1	4	16	0	4	4	0	0	93	
11:05 AM	8	14	10	0	1	16	2	0	2	7	18	0	3	2	2	0	85	
11:10 AM	9	8	12	0	2	13	3	0	4	6	25	0	12	2	0	0	96	
11:15 AM	15	16	9	0	2	16	3	0	2	2	13	0	9	5	1	0	93	
11:20 AM	8	11	12	0	1	13	2	0	7	4	7	0	5	2	2	0	74	
11:25 AM	5	17	5	0	2	10	2	0	5	2	9	0	9	4	3	0	73	
11:30 AM	11	12	15	0	1	19	2	0	1	1	11	0	11	10	0	0	94	
11:35 AM	14	18	11	0	1	13	7	0	7	4	18	0	11	4	2	0	110	
11:40 AM	7	19	14	0	2	10	4	0	3	1	10	0	7	4	3	0	84	
11:45 AM	15	22	10	0	2	18	4	0	4	7	11	0	7	3	3	0	106	
11:50 AM	20	21	11	0	2	18	1	0	1	8	9	0	12	7	2	0	112	
11:55 AM	20	12	6	0	1	18	2	0	4	3	14	0	8	4	5	0	97	1117
12:00 PM	10	14	8	0	0	21	5	0	7	3	12	0	7	5	3	0	95	1119
12:05 PM	15	24	14	0	3	21	5	0	5	2	20	0	35	4	2	0	150	1184
12:10 PM	21	16	11	0	1	23	2	0	4	5	20	0	21	12	1	0	137	1225
12:15 PM	14	11	5	0	4	23	0	0	5	2	23	0	16	5	0	0	108	1240
12:20 PM	19	17	3	0	1	10	2	0	4	5	19	0	7	3	0	0	90	1256
12:25 PM	12	20	7	0	4	19	2	0	5	3	9	0	6	5	1	0	93	1276
12:30 PM	13	9	5	0	1	12	3	0	2	4	17	0	14	3	1	0	84	1266
12:35 PM	12	14	10	0	0	14	8	0	2	5	15	0	13	7	1	0	101	1257
12:40 PM	12	12	7	0	1	17	2	0	9	2	16	0	6	4	1	0	89	1262
12:45 PM	10	19	7	0	0	17	5	0	8	6	13	0	10	2	6	0	103	1259
12:50 PM	9	19	7	0	0	23	2	0	3	3	8	0	7	6	3	0	90	1237
12:55 PM	19	13	8	0	3	18	8	0	8	3	14	0	5	3	1	0	103	1243

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	200	204	120	0	32	268	28	0	56	36	252	0	288	84	12	0	1580
Heavy Trucks	4	4	0		0	4	4		8	4	4		0	4	0		36
Pedestrians		0				0				0				8			8
Bicycles	0	0	0		0	2	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

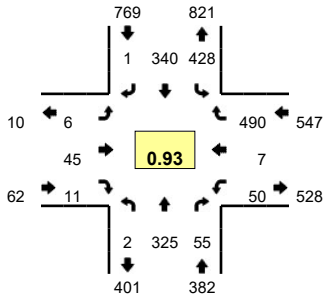
Type of peak hour being reported: Intersection Peak

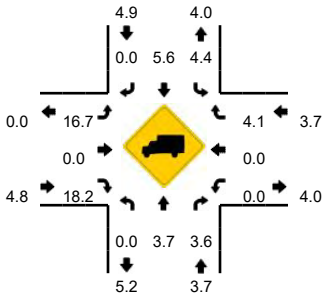
Method for determining peak hour: Total Entering Volume

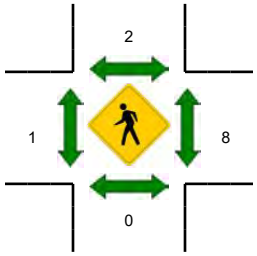
LOCATION: Taylor Rd -- Horseshoe Bar Rd
CITY/STATE: Placer, CA

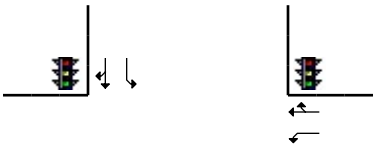
QC JOB #: 13963311
DATE: Thu, Nov 17 2016

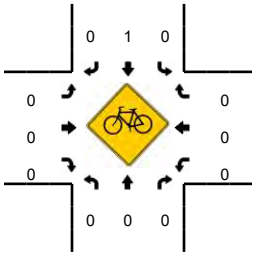
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

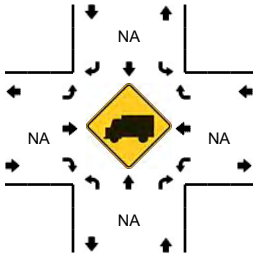


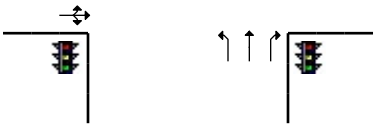


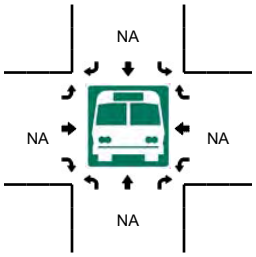












5-Min Count Period Beginning At	Taylor Rd (Northbound)				Taylor Rd (Southbound)				Horseshoe Bar Rd (Eastbound)				Horseshoe Bar Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	17	5	0	24	20	0	0	0	1	0	0	5	1	37	0	110	
7:05 AM	0	12	1	0	41	14	0	0	0	0	1	0	4	0	29	0	102	
7:10 AM	0	20	3	0	36	18	0	0	0	5	0	0	2	2	38	0	124	
7:15 AM	0	34	3	0	36	21	0	0	0	4	0	0	2	0	34	0	134	
7:20 AM	1	22	3	0	38	12	1	0	1	6	0	0	0	0	35	0	119	
7:25 AM	0	32	3	0	31	25	0	0	0	3	1	0	6	1	57	0	159	
7:30 AM	1	32	2	0	28	34	0	0	0	7	0	0	5	1	47	0	157	
7:35 AM	0	33	7	0	32	24	0	0	1	2	3	0	2	2	35	0	141	
7:40 AM	0	26	3	0	42	22	0	0	2	3	4	0	4	2	37	0	145	
7:45 AM	0	18	4	0	47	24	1	0	0	8	1	0	1	0	34	0	138	
7:50 AM	0	20	7	0	43	36	0	0	0	4	1	0	4	0	38	0	153	
7:55 AM	0	31	8	0	39	32	0	0	1	4	0	0	5	1	40	0	161	1643
8:00 AM	0	30	4	0	34	35	0	0	1	2	0	0	4	0	51	0	161	1694
8:05 AM	0	23	5	0	37	27	0	0	0	4	0	0	5	0	41	0	142	1734
8:10 AM	1	21	3	0	38	32	0	0	1	3	0	0	8	0	32	0	139	1749
8:15 AM	0	29	4	0	34	23	0	0	0	2	1	0	2	0	37	0	132	1747
8:20 AM	0	30	5	0	23	26	0	0	0	3	0	0	4	0	41	0	132	1760
8:25 AM	0	27	1	0	25	34	0	0	0	0	2	0	6	0	41	0	136	1737
8:30 AM	0	16	0	0	24	30	0	0	0	0	0	0	1	1	31	0	103	1683
8:35 AM	0	13	2	0	30	21	0	0	0	1	1	0	4	0	24	0	96	1638
8:40 AM	0	12	6	0	31	19	0	0	1	0	0	0	5	3	24	0	101	1594
8:45 AM	0	25	2	0	42	23	0	0	0	0	0	0	4	0	21	0	117	1573
8:50 AM	0	20	4	0	18	12	0	0	0	0	1	0	9	0	16	0	80	1500
8:55 AM	0	15	6	0	23	19	0	0	1	0	0	0	5	0	23	0	92	1431

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	324	76	0	464	412	0	0	8	40	4	0	52	4	516	0	1900
Heavy Trucks	0	12	0		16	24	0		4	0	0		0	0	28		84
Pedestrians		0				0				0				12			12
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

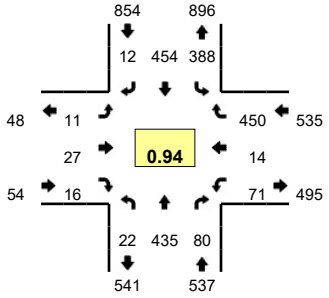
Type of peak hour being reported: Intersection Peak

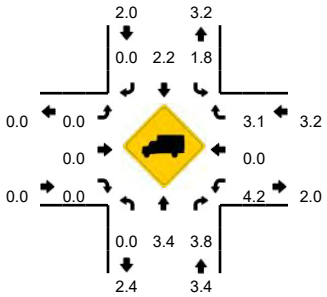
Method for determining peak hour: Total Entering Volume

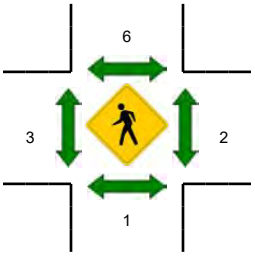
LOCATION: Taylor Rd -- Horseshoe Bar Rd
CITY/STATE: Placer, CA

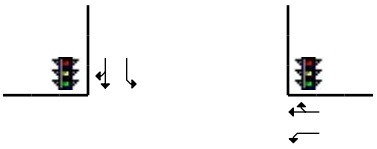
QC JOB #: 13963312
DATE: Thu, Nov 17 2016

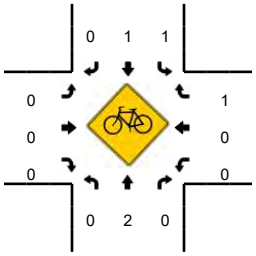
Peak-Hour: 4:20 PM -- 5:20 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

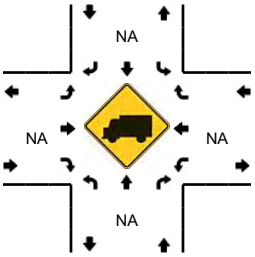


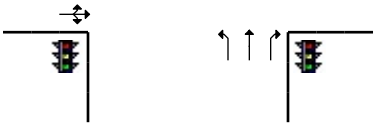


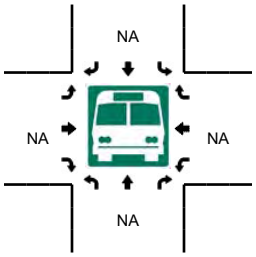












5-Min Count Period Beginning At	Taylor Rd (Northbound)				Taylor Rd (Southbound)				Horseshoe Bar Rd (Eastbound)				Horseshoe Bar Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	57	11	0	25	40	0	0	0	1	0	0	7	0	37	0	178	
4:05 PM	0	34	9	0	38	35	0	0	1	0	0	0	12	0	34	0	163	
4:10 PM	2	25	8	0	37	30	3	0	0	2	1	0	6	0	40	0	154	
4:15 PM	2	31	6	0	28	38	0	0	0	0	0	0	6	2	43	0	156	
4:20 PM	1	57	4	0	27	38	4	0	2	2	1	0	4	1	42	0	183	
4:25 PM	3	31	8	0	30	28	0	0	0	2	0	0	5	0	45	0	152	
4:30 PM	3	43	8	0	33	38	2	0	0	2	2	0	6	0	29	0	166	
4:35 PM	0	31	4	0	34	42	0	0	2	1	1	0	8	2	34	0	159	
4:40 PM	2	35	6	0	35	47	0	0	1	4	2	0	7	1	36	0	176	
4:45 PM	1	44	7	0	43	37	1	0	0	1	1	0	2	0	39	0	176	
4:50 PM	0	32	7	0	28	24	0	0	4	4	0	0	6	2	37	0	144	
4:55 PM	0	23	3	0	35	36	0	0	0	0	1	0	7	3	38	0	146	1953
5:00 PM	4	35	9	0	22	34	0	0	1	2	0	0	5	1	39	0	152	1927
5:05 PM	0	32	6	0	32	46	1	0	1	1	2	0	6	3	31	0	161	1925
5:10 PM	7	36	11	0	37	46	1	0	0	3	0	0	7	0	39	0	187	1958
5:15 PM	1	36	7	0	32	38	3	0	0	5	6	0	8	1	41	0	178	1980
5:20 PM	0	30	8	0	32	34	0	0	0	0	0	0	10	2	39	0	155	1952
5:25 PM	0	39	9	0	29	25	1	0	1	1	0	0	8	2	29	0	144	1944
5:30 PM	0	25	6	0	30	28	1	0	1	1	1	0	9	4	32	0	138	1916
5:35 PM	1	35	6	0	33	27	2	0	0	4	1	0	1	3	27	0	140	1897
5:40 PM	1	38	10	0	35	32	0	0	1	2	2	0	6	0	45	0	172	1893
5:45 PM	1	34	4	0	27	21	0	0	1	2	1	0	10	2	49	0	152	1869
5:50 PM	0	43	5	0	32	28	0	0	0	2	1	0	3	1	45	0	160	1885
5:55 PM	0	28	6	0	21	30	0	0	0	0	0	0	6	1	39	0	131	1870

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	416	96	0	404	520	20	0	4	36	32	0	84	16	444	0	2104
Heavy Trucks	0	16	8		0	16	0		0	0	0		4	0	28		72
Pedestrians		0				4				8				0			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

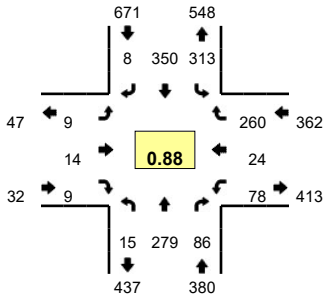
Type of peak hour being reported: Intersection Peak

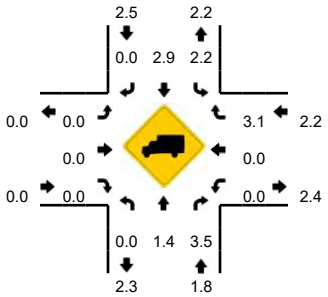
Method for determining peak hour: Total Entering Volume

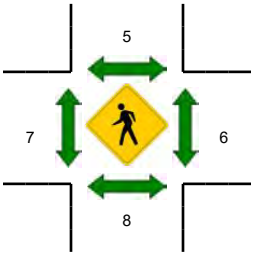
LOCATION: B2 - Taylor†Rd -- Horseshoe†Bar†Rd
CITY/STATE: Loomis, CA

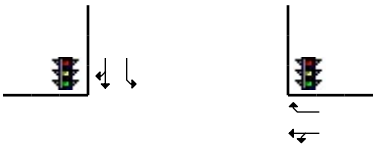
QC JOB #: 14088506
DATE: Sat, Jan 28 2017

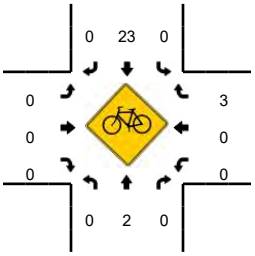
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:05 PM -- 12:20 PM

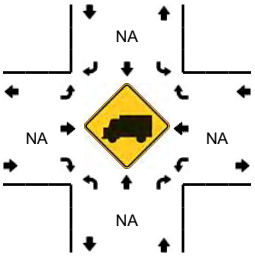


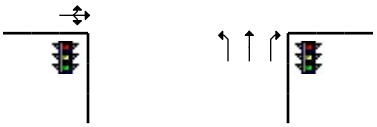


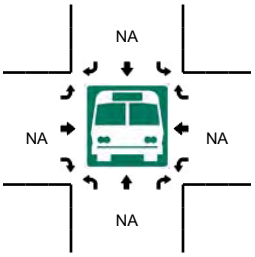












5-Min Count Period Beginning At	B2 - Taylor†Rd (Northbound)				B2 - Taylor†Rd (Southbound)				Horseshoe†Bar†Rd (Eastbound)				Horseshoe†Bar†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	22	6	0	21	23	0	0	0	0	0	0	5	1	26	0	104	
11:05 AM	1	19	9	0	18	30	0	0	0	2	1	0	8	0	18	0	106	
11:10 AM	1	17	1	0	25	28	1	0	0	0	1	0	6	1	19	0	100	
11:15 AM	1	23	7	0	18	32	0	0	0	0	1	0	3	0	22	0	107	
11:20 AM	1	25	6	0	21	16	0	0	0	1	1	0	10	1	13	0	95	
11:25 AM	1	18	9	0	23	21	0	0	0	0	1	0	9	0	16	0	98	
11:30 AM	0	26	6	0	19	24	0	0	0	1	2	0	4	0	24	0	106	
11:35 AM	0	28	9	0	14	29	0	0	1	2	1	0	11	0	24	0	119	
11:40 AM	0	19	6	0	27	23	0	0	0	4	0	0	3	2	24	0	108	
11:45 AM	1	29	11	0	17	21	0	0	0	0	1	0	7	0	21	0	108	
11:50 AM	1	30	8	0	26	29	1	0	3	1	0	1	3	1	27	0	131	
11:55 AM	0	20	4	0	22	16	0	0	0	0	0	0	7	2	29	0	100	1282
12:00 PM	2	23	13	0	16	24	0	0	0	0	0	0	6	1	24	0	109	1287
12:05 PM	0	35	9	0	30	35	1	0	0	0	1	0	3	0	23	0	137	1318
12:10 PM	2	21	7	0	40	40	2	0	1	3	0	0	8	3	30	0	157	1375
12:15 PM	1	20	2	0	22	38	0	0	0	3	1	0	7	1	21	0	116	1384
12:20 PM	0	14	1	0	35	32	1	0	1	0	1	0	6	2	22	0	115	1404
12:25 PM	4	32	12	0	16	26	0	0	1	5	1	0	10	1	20	0	128	1434
12:30 PM	2	18	4	0	22	28	0	0	1	1	0	0	6	4	16	0	102	1430
12:35 PM	1	23	7	0	28	21	0	0	4	0	0	0	4	0	23	0	111	1422
12:40 PM	0	24	10	0	32	24	0	0	0	2	1	0	5	2	19	0	119	1433
12:45 PM	1	25	5	0	26	24	1	0	0	0	3	0	11	4	19	0	119	1444
12:50 PM	1	18	8	0	25	27	2	0	0	0	1	0	3	6	20	0	111	1424
12:55 PM	1	26	8	0	21	31	1	0	1	0	0	0	9	0	23	0	121	1445

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	304	72	0	368	452	12	0	4	24	8	0	72	16	296	0	1640
Heavy Trucks	0	0	0		4	0	0		0	0	0		0	0	8		12
Pedestrians		8				12				20				0			40
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

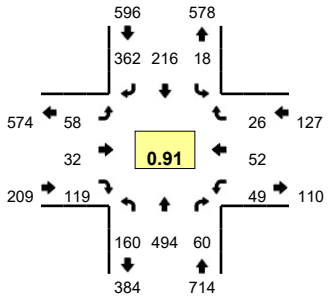
Type of peak hour being reported: Intersection Peak

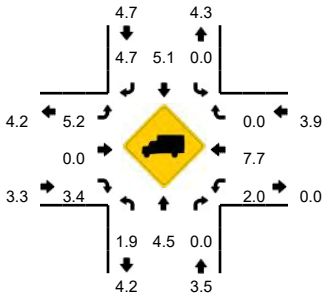
Method for determining peak hour: Total Entering Volume

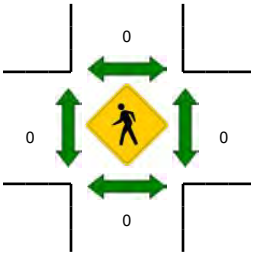
LOCATION: Horseshoe Bar Rd -- I-80 WB Ramp
CITY/STATE: Placer, CA

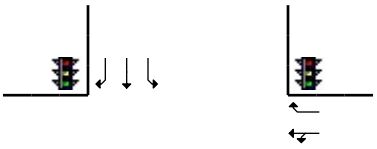
QC JOB #: 13963333
DATE: Thu, Nov 17 2016

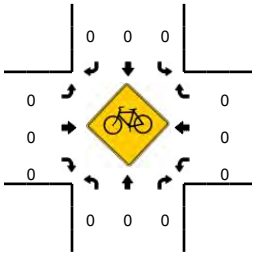
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

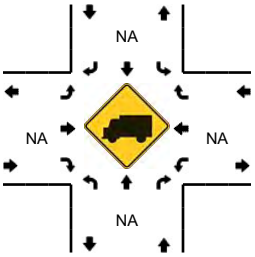


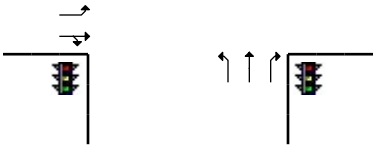


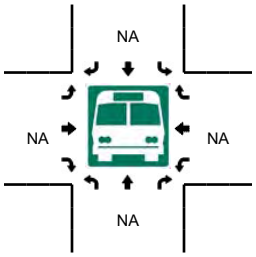












5-Min Count Period Beginning At	Horseshoe Bar Rd (Northbound)				Horseshoe Bar Rd (Southbound)				I-80 WB Ramp (Eastbound)				I-80 WB Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	11	42	3	0	2	6	26	0	3	2	4	0	3	0	0	0	102	
7:05 AM	9	32	3	0	2	15	28	0	5	2	8	0	2	2	1	0	109	
7:10 AM	6	33	4	0	0	9	30	0	4	4	13	0	1	2	1	0	107	
7:15 AM	9	35	6	0	1	19	33	0	2	3	11	0	1	4	2	0	126	
7:20 AM	13	38	4	0	3	14	33	0	1	4	10	0	4	1	1	0	126	
7:25 AM	12	54	3	0	1	21	28	0	9	4	9	0	2	3	1	0	147	
7:30 AM	17	51	8	0	2	20	26	0	5	1	11	0	6	4	3	0	154	
7:35 AM	11	47	6	0	1	16	32	0	3	4	11	0	4	7	4	0	146	
7:40 AM	16	22	2	0	1	26	22	0	4	0	10	0	5	6	4	0	118	
7:45 AM	17	39	6	0	2	17	37	0	4	2	5	0	4	6	2	0	141	
7:50 AM	15	43	7	0	0	29	37	0	7	3	16	0	7	2	1	0	167	
7:55 AM	11	45	3	0	2	13	36	0	6	4	7	0	3	8	2	0	140	1583
8:00 AM	13	54	5	0	2	15	26	0	7	4	12	0	4	3	1	0	146	1627
8:05 AM	12	36	6	0	2	17	25	0	5	2	2	0	6	4	5	0	122	1640
8:10 AM	14	30	4	0	1	9	27	0	5	1	15	0	3	4	0	0	113	1646
8:15 AM	18	36	6	0	0	19	15	0	4	1	6	0	3	1	2	0	111	1631
8:20 AM	17	42	7	0	1	12	21	0	9	2	7	0	7	5	2	0	132	1637
8:25 AM	11	35	7	0	1	9	17	0	9	7	9	0	2	4	2	0	113	1603
8:30 AM	16	34	1	0	1	12	23	0	5	2	6	0	6	7	3	0	116	1565
8:35 AM	9	25	5	0	3	14	26	0	6	2	10	0	5	4	0	0	109	1528
8:40 AM	12	31	10	0	2	8	21	0	5	3	6	0	1	2	4	0	105	1515
8:45 AM	10	23	6	0	1	16	30	0	3	2	9	0	5	4	0	0	109	1483
8:50 AM	10	17	1	0	1	11	24	0	5	3	6	0	1	4	1	0	84	1400
8:55 AM	6	19	4	0	4	4	15	0	5	1	7	0	3	7	3	0	78	1338

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	156	568	60	0	16	228	396	0	80	44	140	0	56	52	16	0	1812
Heavy Trucks	0	40	0		0	12	8		0	0	4		4	4	0		72
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

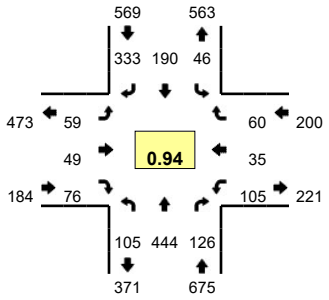
Type of peak hour being reported: Intersection Peak

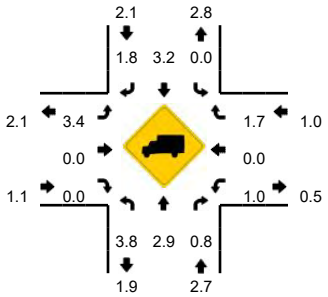
Method for determining peak hour: Total Entering Volume

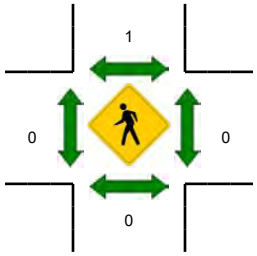
LOCATION: Horseshoe Bar Rd -- I-80 WB Ramp
CITY/STATE: Placer, CA

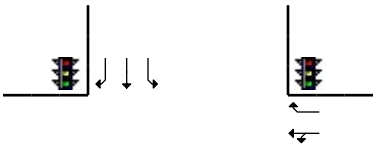
QC JOB #: 13963334
DATE: Thu, Nov 17 2016

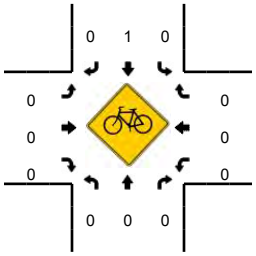
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

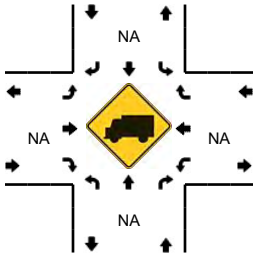


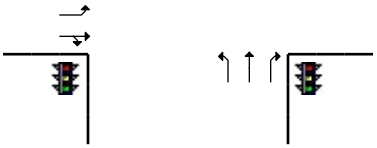


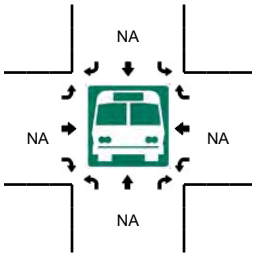












5-Min Count Period Beginning At	Horseshoe Bar Rd (Northbound)				Horseshoe Bar Rd (Southbound)				I-80 WB Ramp (Eastbound)				I-80 WB Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	32	6	0	1	21	20	0	6	2	7	0	3	5	5	0	117	
4:05 PM	11	28	7	0	1	20	23	0	9	5	5	0	12	3	4	0	128	
4:10 PM	8	37	12	0	3	24	38	0	4	8	6	0	3	3	9	0	155	
4:15 PM	6	40	7	0	4	12	20	0	7	1	6	0	8	5	3	0	119	
4:20 PM	12	47	8	0	4	16	26	0	3	1	10	0	3	2	7	0	139	
4:25 PM	3	31	13	0	4	13	24	0	8	4	3	0	11	7	8	0	129	
4:30 PM	6	21	11	0	2	14	32	0	5	6	4	0	7	3	6	0	117	
4:35 PM	7	37	12	0	3	14	28	0	2	3	6	0	6	2	4	0	124	
4:40 PM	8	34	12	0	1	18	27	0	6	1	3	0	13	4	4	0	131	
4:45 PM	10	43	12	0	4	19	37	0	4	4	5	0	11	2	3	0	154	
4:50 PM	8	34	3	0	2	13	32	0	5	5	4	0	14	1	5	0	126	
4:55 PM	8	40	13	0	4	12	33	0	3	6	4	0	6	5	8	0	142	1581
5:00 PM	4	33	21	0	1	15	25	0	4	2	4	0	7	3	6	0	125	1589
5:05 PM	13	29	18	0	6	17	32	0	6	3	6	0	9	3	6	0	148	1609
5:10 PM	14	45	8	0	4	22	31	0	4	1	15	0	7	3	4	0	158	1612
5:15 PM	5	28	6	0	5	17	25	0	4	6	4	0	5	2	7	0	114	1607
5:20 PM	4	39	10	0	5	14	29	0	5	4	9	0	10	2	5	0	136	1604
5:25 PM	7	32	9	0	3	16	25	0	9	8	9	0	6	6	2	0	132	1607
5:30 PM	10	35	12	0	4	12	22	0	7	4	5	0	8	5	6	0	130	1620
5:35 PM	6	30	6	0	3	19	21	0	4	3	5	0	12	2	4	0	115	1611
5:40 PM	16	56	8	0	5	14	21	0	4	3	6	0	10	1	4	0	148	1628
5:45 PM	4	43	14	0	3	14	25	0	3	6	3	0	9	4	7	0	135	1609
5:50 PM	16	41	13	0	4	10	23	0	3	4	3	0	6	4	3	0	130	1613
5:55 PM	5	35	17	0	6	10	9	0	7	6	6	0	9	4	5	0	119	1590

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	124	428	188	0	44	216	352	0	56	24	100	0	92	36	64	0	1724
Heavy Trucks	12	28	4		0	4	4		4	0	0		0	0	4		60
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

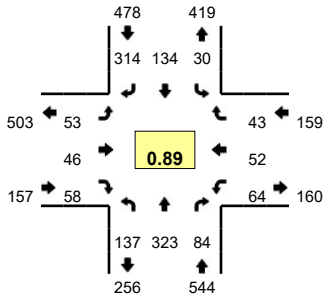
Type of peak hour being reported: Intersection Peak

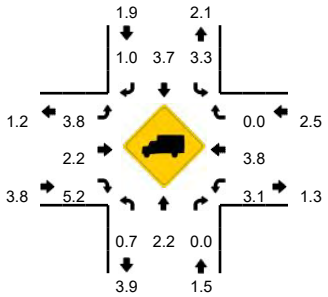
Method for determining peak hour: Total Entering Volume

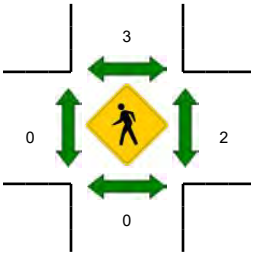
LOCATION: B3 - Horseshoe Bar Rd -- I-80†WB†Ramp
CITY/STATE: Placer, CA

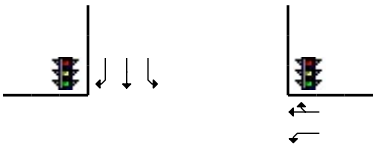
QC JOB #: 14088517
DATE: Sat, Jan 28 2017

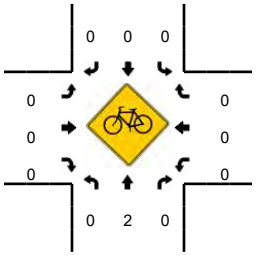
Peak-Hour: 11:50 AM -- 12:50 PM
Peak 15-Min: 12:10 PM -- 12:25 PM

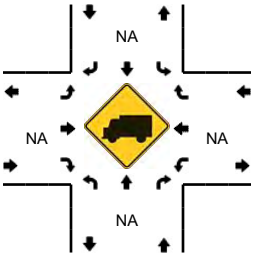


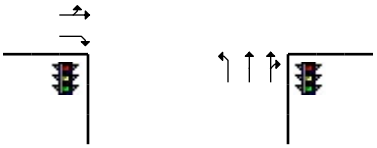


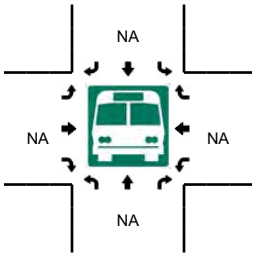












5-Min Count Period Beginning At	B3 - Horseshoe Bar Rd (Northbound)				B3 - Horseshoe Bar Rd (Southbound)				I-80†WB†Ramp (Eastbound)				I-80†WB†Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	7	17	5	0	2	8	16	0	5	3	9	0	3	2	8	0	85	
11:05 AM	13	21	4	0	1	17	14	0	6	4	4	0	5	2	2	0	93	
11:10 AM	10	26	7	0	3	7	17	0	4	4	8	0	3	8	2	0	99	
11:15 AM	8	24	7	0	1	5	15	0	8	4	4	0	6	2	1	0	85	
11:20 AM	12	15	8	0	3	10	20	0	2	3	3	0	2	6	3	0	87	
11:25 AM	4	28	11	0	2	10	12	0	5	3	5	0	4	6	4	0	94	
11:30 AM	17	21	4	0	3	9	24	0	3	7	5	0	8	4	5	0	110	
11:35 AM	12	27	9	0	1	14	12	0	1	4	5	0	4	3	4	0	96	
11:40 AM	7	21	11	0	7	12	17	0	1	3	2	0	0	4	8	0	93	
11:45 AM	9	20	9	0	2	18	17	0	4	4	5	0	5	3	6	0	102	
11:50 AM	15	43	6	0	4	13	30	0	3	2	6	0	5	5	5	0	137	
11:55 AM	9	40	6	0	4	7	21	0	5	5	0	0	4	4	4	0	109	1190
12:00 PM	10	19	10	0	3	15	20	0	7	5	9	0	6	6	4	0	114	1219
12:05 PM	11	16	6	0	1	11	25	0	4	3	3	0	7	2	1	0	90	1216
12:10 PM	18	26	4	0	4	13	39	0	7	2	6	0	6	4	4	0	133	1250
12:15 PM	20	32	9	0	4	5	26	0	3	3	5	0	7	5	4	0	123	1288
12:20 PM	9	26	7	0	2	6	39	0	7	6	5	0	4	4	3	0	118	1319
12:25 PM	9	23	5	0	1	8	26	0	5	1	7	0	3	4	6	0	98	1323
12:30 PM	5	15	9	0	1	17	25	0	2	6	0	0	3	5	5	0	93	1306
12:35 PM	7	23	7	0	2	13	21	0	5	4	6	0	7	4	3	0	102	1312
12:40 PM	10	29	10	0	3	19	19	0	1	5	8	0	5	5	1	0	115	1334
12:45 PM	14	31	5	0	1	7	23	0	4	4	3	0	7	4	3	0	106	1338
12:50 PM	12	21	8	0	3	12	19	0	6	5	4	0	7	6	3	0	106	1307
12:55 PM	8	32	7	0	3	7	20	0	4	1	4	0	1	7	6	0	100	1298

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	188	336	80	0	40	96	416	0	68	44	64	0	68	52	44	0	1496
Heavy Trucks	4	4	0		0	0	4		0	0	4		4	4	0		24
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

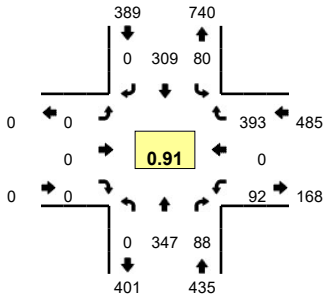
Type of peak hour being reported: Intersection Peak

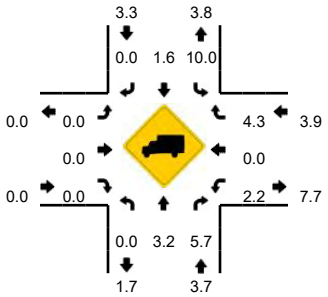
Method for determining peak hour: Total Entering Volume

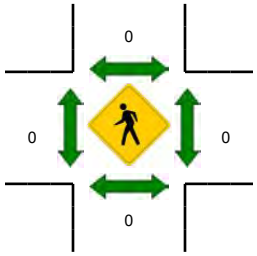
LOCATION: Horseshoe Bar Rd -- I-80 EB Ramp
CITY/STATE: Loomis, CA

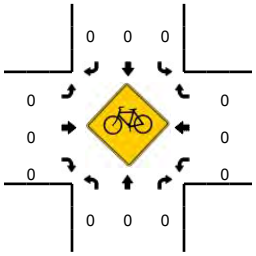
QC JOB #: 13963335
DATE: Thu, Nov 17 2016

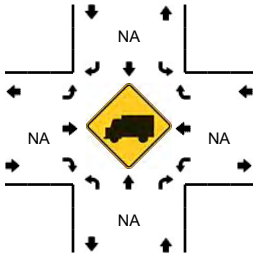
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

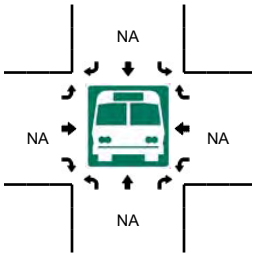












5-Min Count Period Beginning At	Horseshoe Bar Rd (Northbound)				Horseshoe Bar Rd (Southbound)				I-80 EB Ramp (Eastbound)				I-80 EB Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	17	6	0	2	11	0	0	0	0	0	0	1	0	28	0	65	
7:05 AM	0	17	0	0	4	21	0	0	0	0	0	0	1	0	25	0	68	
7:10 AM	0	18	4	0	4	17	0	0	0	0	0	0	3	0	29	0	75	
7:15 AM	0	20	8	0	5	26	0	0	0	0	0	0	3	0	31	0	93	
7:20 AM	0	29	10	0	9	20	0	0	0	0	0	0	1	0	30	0	99	
7:25 AM	0	30	2	0	9	26	0	0	0	0	0	0	7	0	35	0	109	
7:30 AM	0	36	6	0	10	26	0	0	0	0	0	0	4	0	48	0	130	
7:35 AM	0	23	7	0	11	21	0	0	0	0	0	0	5	0	33	0	100	
7:40 AM	0	26	10	0	11	31	0	0	0	0	0	0	6	0	21	0	105	
7:45 AM	0	27	11	0	4	23	0	0	0	0	0	0	11	0	31	0	107	
7:50 AM	0	25	11	0	9	44	0	0	0	0	0	0	9	0	36	0	134	
7:55 AM	0	35	7	0	1	22	0	0	0	0	0	0	11	0	37	0	113	1198
8:00 AM	0	25	8	0	3	28	0	0	0	0	0	0	8	0	41	0	113	1246
8:05 AM	0	28	11	0	7	18	0	0	0	0	0	0	14	0	25	0	103	1281
8:10 AM	0	29	5	0	5	24	0	0	0	0	0	0	5	0	20	0	88	1294
8:15 AM	0	29	2	0	4	25	0	0	0	0	0	0	4	0	29	0	93	1294
8:20 AM	0	34	8	0	6	21	0	0	0	0	0	0	8	0	37	0	114	1309
8:25 AM	0	22	11	0	3	17	0	0	0	0	0	0	8	0	31	0	92	1292
8:30 AM	0	21	9	0	8	15	0	0	0	0	0	0	4	0	23	0	80	1242
8:35 AM	0	19	6	0	11	18	0	0	0	0	0	0	3	0	19	0	76	1218
8:40 AM	0	29	5	0	3	11	0	0	0	0	0	0	4	0	27	0	79	1192
8:45 AM	0	17	5	0	8	23	0	0	0	0	0	0	7	0	22	0	82	1167
8:50 AM	0	15	3	0	4	14	0	0	0	0	0	0	6	0	12	0	54	1087
8:55 AM	0	13	5	0	1	13	0	0	0	0	0	0	5	0	16	0	53	1027

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	340	104	0	52	376	0	0	0	0	0	0	112	0	456	0	1440
Heavy Trucks	0	20	8		4	8	0		0	0	0		0	0	16		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

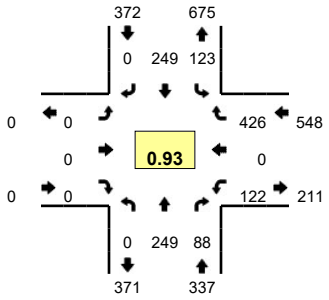
Type of peak hour being reported: Intersection Peak

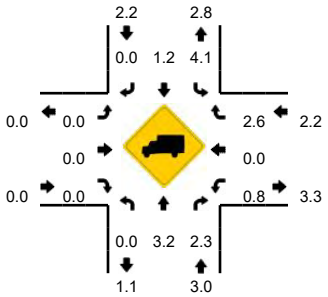
Method for determining peak hour: Total Entering Volume

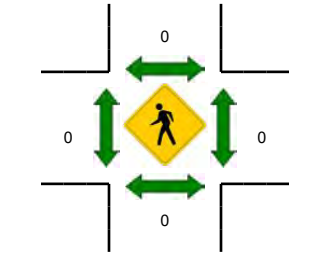
LOCATION: Horseshoe Bar Rd -- I-80 EB Ramp
CITY/STATE: Loomis, CA

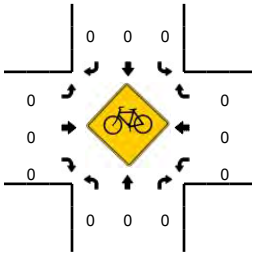
QC JOB #: 13963336
DATE: Thu, Nov 17 2016

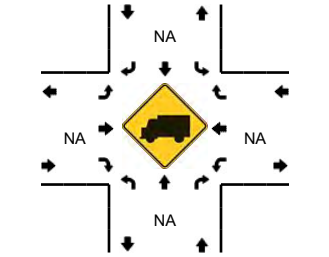
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

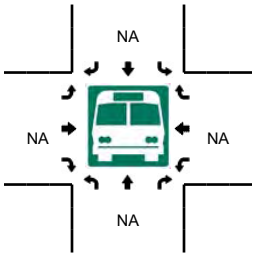












5-Min Count Period Beginning At	Horseshoe Bar Rd (Northbound)				Horseshoe Bar Rd (Southbound)				I-80 EB Ramp (Eastbound)				I-80 EB Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	11	8	0	12	18	0	0	0	0	0	0	8	0	33	1	91	
4:05 PM	0	21	7	0	13	27	0	0	0	0	0	0	8	0	31	0	107	
4:10 PM	0	18	13	0	8	25	0	0	0	0	0	0	10	0	38	0	112	
4:15 PM	0	19	5	0	7	17	0	0	0	0	0	0	8	0	37	0	93	
4:20 PM	0	22	5	0	9	22	0	0	0	0	0	0	7	0	37	0	102	
4:25 PM	0	17	8	0	16	14	0	0	0	0	0	0	11	0	33	0	99	
4:30 PM	0	15	8	0	8	17	0	0	0	0	0	0	10	0	28	0	86	
4:35 PM	0	22	9	0	7	19	0	0	0	0	0	0	6	0	31	0	94	
4:40 PM	0	23	7	0	11	25	0	0	0	0	0	0	16	0	34	0	116	
4:45 PM	0	24	8	0	8	24	0	0	0	0	0	0	12	0	33	0	109	
4:50 PM	0	15	4	0	10	23	0	0	0	0	0	0	12	0	36	0	100	
4:55 PM	0	25	14	0	11	12	0	0	0	0	0	0	11	0	36	0	109	1218
5:00 PM	0	19	5	0	9	17	0	0	0	0	0	0	7	0	43	0	100	1227
5:05 PM	0	23	8	0	11	22	0	0	0	0	0	0	8	0	35	0	107	1227
5:10 PM	0	22	6	0	9	35	0	0	0	0	0	0	13	0	35	0	120	1235
5:15 PM	0	11	3	0	13	10	0	0	0	0	0	0	8	0	29	0	74	1216
5:20 PM	0	17	6	0	14	20	0	0	0	0	0	0	10	0	38	0	105	1219
5:25 PM	0	26	9	0	10	21	0	0	0	0	0	0	9	0	21	0	96	1216
5:30 PM	0	22	11	0	8	19	0	0	0	0	0	0	15	0	40	0	115	1245
5:35 PM	0	16	3	0	9	27	0	0	0	0	0	0	5	0	33	0	93	1244
5:40 PM	0	29	11	0	11	19	0	0	0	0	0	0	12	0	47	0	129	1257
5:45 PM	0	12	9	0	9	17	0	0	0	0	0	0	9	0	49	0	105	1253
5:50 PM	0	29	4	0	5	14	0	0	0	0	0	0	9	0	42	0	103	1256
5:55 PM	0	15	4	0	6	17	0	0	0	0	0	0	15	0	44	0	101	1248

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	268	100	0	112	260	0	0	0	0	0	0	128	0	480	0	1348
Heavy Trucks	0	0	0		8	0	0		0	0	0		0	0	12		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

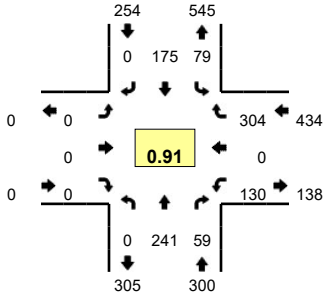
Type of peak hour being reported: Intersection Peak

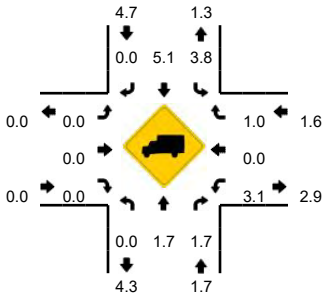
Method for determining peak hour: Total Entering Volume

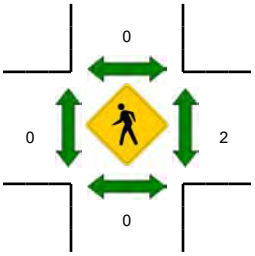
LOCATION: B4 - Horseshoe Bar Rd -- I-80†EB†Ramp
CITY/STATE: Placer, CA

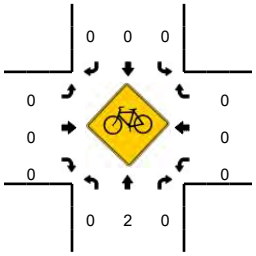
QC JOB #: 14088518
DATE: Sat, Jan 28 2017

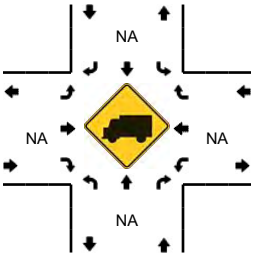
Peak-Hour: 11:50 AM -- 12:50 PM
Peak 15-Min: 12:35 PM -- 12:50 PM

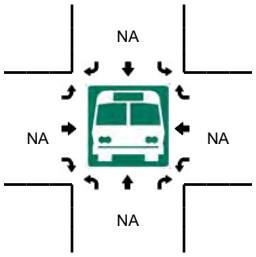












5-Min Count Period Beginning At	B4 - Horseshoe Bar Rd (Northbound)				B4 - Horseshoe Bar Rd (Southbound)				I-80†EB†Ramp (Eastbound)				I-80†EB†Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	16	3	0	3	16	0	0	0	0	0	0	6	0	12	0	56	
11:05 AM	0	16	6	0	8	21	0	0	0	0	0	0	6	0	20	0	77	
11:10 AM	0	15	8	0	6	10	0	0	0	0	0	0	13	0	30	0	82	
11:15 AM	0	19	7	0	5	12	0	0	0	0	0	0	7	0	23	0	73	
11:20 AM	0	14	6	0	5	8	0	0	0	0	0	0	6	0	17	0	56	
11:25 AM	0	16	5	0	4	17	0	0	0	0	0	0	9	0	28	0	79	
11:30 AM	0	24	4	0	12	9	0	0	0	0	0	0	5	0	19	0	73	
11:35 AM	0	18	3	0	10	11	0	0	0	0	0	0	7	0	29	0	78	
11:40 AM	0	13	6	0	2	12	0	0	0	0	0	0	10	0	26	0	69	
11:45 AM	0	17	5	0	9	18	0	0	0	0	0	0	11	0	28	0	88	
11:50 AM	0	25	5	0	9	15	0	0	0	0	0	0	9	0	37	0	100	
11:55 AM	0	19	2	0	4	7	0	0	0	0	0	0	9	0	36	0	77	908
12:00 PM	0	14	6	0	8	21	0	0	0	0	0	0	8	0	26	0	83	935
12:05 PM	0	22	3	0	10	9	0	0	0	0	0	0	6	0	19	0	69	927
12:10 PM	0	19	3	0	3	26	0	0	0	0	0	0	13	0	20	0	84	929
12:15 PM	0	31	8	0	4	12	0	0	0	0	0	0	9	0	34	0	98	954
12:20 PM	0	23	3	0	4	10	0	0	0	0	0	0	12	0	16	0	68	966
12:25 PM	0	20	4	0	7	11	0	0	0	0	0	0	7	0	17	0	66	953
12:30 PM	0	12	7	0	10	11	0	0	0	0	0	0	12	0	21	0	73	953
12:35 PM	0	11	6	0	11	14	0	0	0	0	0	0	13	0	22	0	77	952
12:40 PM	0	22	3	0	5	25	0	0	0	0	0	0	17	0	29	0	101	984
12:45 PM	0	23	9	0	4	14	0	0	0	0	0	0	15	0	27	0	92	988
12:50 PM	0	15	3	0	3	19	0	0	0	0	0	0	13	0	26	0	79	967
12:55 PM	0	15	4	0	4	7	0	0	0	0	0	0	16	0	34	0	80	970

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	224	72	0	80	212	0	0	0	0	0	0	180	0	312	0	1080
Heavy Trucks	0	0	4		0	4	0		0	0	0		4	0	8		20
Pedestrians		0				0				0				8			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

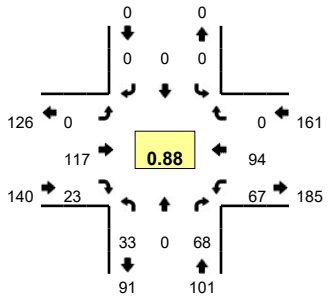
Type of peak hour being reported: Intersection Peak

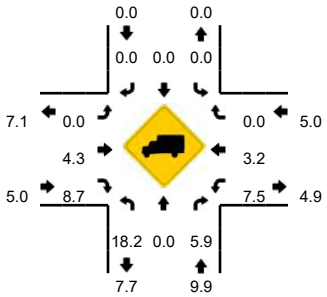
Method for determining peak hour: Total Entering Volume

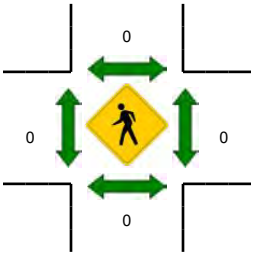
LOCATION: Barton Rd -- Brace Rd
CITY/STATE: Loomis, CA

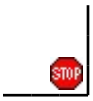
QC JOB #: 13963313
DATE: Thu, Nov 17 2016

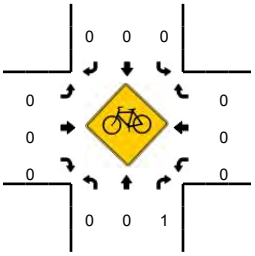
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

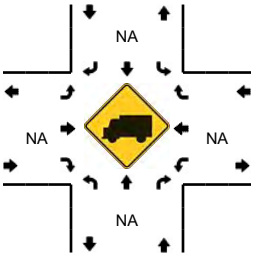


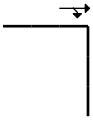


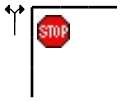


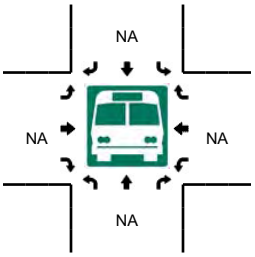












5-Min Count Period Beginning At	Barton Rd (Northbound)				Barton Rd (Southbound)				Brace Rd (Eastbound)				Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	0	5	0	0	0	0	0	0	3	1	0	3	6	0	0	19	
7:05 AM	0	0	4	0	0	0	0	0	0	5	1	0	3	2	0	0	15	
7:10 AM	4	0	4	0	0	0	0	0	0	7	0	0	6	3	0	0	24	
7:15 AM	0	0	6	0	0	0	0	0	0	5	3	0	3	4	0	0	21	
7:20 AM	3	0	7	0	0	0	0	0	0	10	0	0	4	2	0	0	26	
7:25 AM	3	0	4	1	0	0	0	0	0	8	2	0	7	7	0	0	32	
7:30 AM	3	0	11	0	0	0	0	0	0	10	1	0	9	3	0	0	37	
7:35 AM	2	0	6	0	0	0	0	0	0	8	2	0	5	5	0	0	28	
7:40 AM	2	0	8	0	0	0	0	0	0	15	1	0	4	9	0	0	39	
7:45 AM	2	0	7	0	0	0	0	0	0	5	2	0	5	11	0	0	32	
7:50 AM	4	0	7	0	0	0	0	0	0	16	2	0	7	6	0	0	42	
7:55 AM	6	0	5	0	0	0	0	0	0	10	2	0	5	7	0	0	35	350
8:00 AM	2	0	7	0	0	0	0	0	0	10	1	0	6	11	0	0	37	368
8:05 AM	3	0	1	0	0	0	0	0	0	8	2	0	7	5	0	0	26	379
8:10 AM	2	0	3	0	0	0	0	0	0	11	3	0	7	7	0	0	33	388
8:15 AM	2	0	3	0	0	0	0	0	0	5	1	0	4	13	0	0	28	395
8:20 AM	1	0	6	0	0	0	0	0	0	11	4	0	1	10	0	0	33	402
8:25 AM	2	0	2	0	0	0	0	0	0	13	0	0	8	7	0	0	32	402
8:30 AM	4	0	4	0	0	0	0	0	0	4	1	0	5	9	0	0	27	392
8:35 AM	1	0	2	0	0	0	0	0	0	2	4	0	4	11	0	0	24	388
8:40 AM	1	0	2	0	0	0	0	0	0	5	0	0	4	9	0	0	21	370
8:45 AM	2	0	3	0	0	0	0	0	0	8	0	0	8	6	0	0	27	365
8:50 AM	2	0	4	0	0	0	0	0	0	6	4	0	8	5	0	0	29	352
8:55 AM	1	0	3	0	0	0	0	0	0	6	1	0	8	7	0	0	26	343

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	0	76	0	0	0	0	0	0	144	20	0	72	96	0	0	456
Heavy Trucks	8	0	8		0	0	0		0	0	4		4	0	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

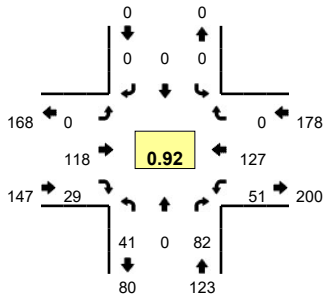
Type of peak hour being reported: Intersection Peak

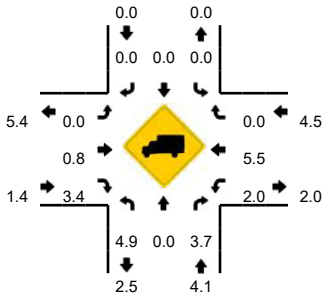
Method for determining peak hour: Total Entering Volume

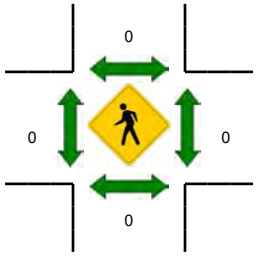
LOCATION: Barton Rd -- Brace Rd
CITY/STATE: Loomis, CA

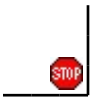
QC JOB #: 13963314
DATE: Thu, Nov 17 2016

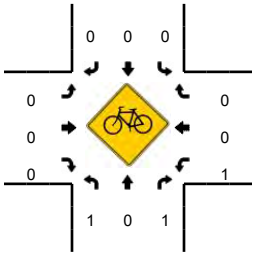
Peak-Hour: 4:05 PM -- 5:05 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

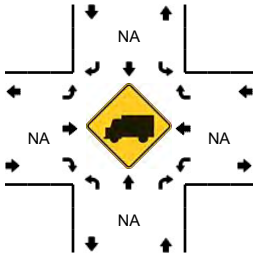


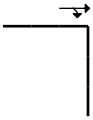


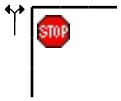


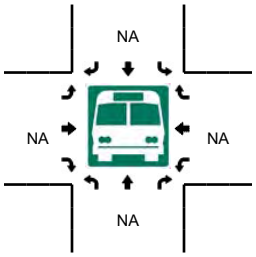












5-Min Count Period Beginning At	Barton Rd (Northbound)				Barton Rd (Southbound)				Brace Rd (Eastbound)				Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	3	0	0	0	0	0	0	12	0	0	4	7	0	0	28	
4:05 PM	3	0	9	0	0	0	0	0	0	7	0	0	5	11	0	0	35	
4:10 PM	0	0	7	0	0	0	0	0	0	5	3	0	5	18	0	0	38	
4:15 PM	7	0	8	0	0	0	0	0	0	3	4	0	3	10	0	0	35	
4:20 PM	5	0	6	0	0	0	0	0	0	14	3	0	3	8	0	0	39	
4:25 PM	4	0	3	0	0	0	0	0	0	7	1	0	4	13	0	0	32	
4:30 PM	2	0	5	0	0	0	0	0	0	15	2	0	0	14	0	0	38	
4:35 PM	3	0	14	0	0	0	0	0	0	9	1	0	7	15	0	0	49	
4:40 PM	2	0	6	0	0	0	0	0	0	10	5	0	4	8	0	0	35	
4:45 PM	4	0	6	0	0	0	0	0	0	11	0	0	6	10	0	0	37	
4:50 PM	4	0	7	0	0	0	0	0	0	15	2	0	8	9	0	0	45	
4:55 PM	2	0	3	0	0	0	0	0	0	10	4	0	2	4	0	0	25	436
5:00 PM	5	0	8	0	0	0	0	0	0	12	4	0	4	7	0	0	40	448
5:05 PM	4	0	2	0	0	0	0	0	0	11	2	0	4	9	0	0	32	445
5:10 PM	2	0	6	0	0	0	0	0	0	8	2	0	8	15	0	0	41	448
5:15 PM	2	0	4	0	0	0	0	0	0	9	0	0	4	9	0	0	28	441
5:20 PM	4	0	4	0	0	0	0	0	0	10	3	0	5	9	0	0	35	437
5:25 PM	3	0	6	0	0	0	0	0	0	12	4	0	6	7	0	0	38	443
5:30 PM	3	0	6	0	0	0	0	0	0	7	1	0	6	6	0	0	29	434
5:35 PM	3	0	8	0	0	0	0	0	0	11	2	0	8	7	0	0	39	424
5:40 PM	1	0	8	0	0	0	0	0	0	7	1	0	8	9	0	0	34	423
5:45 PM	2	0	3	0	0	0	0	0	0	8	0	0	4	8	0	0	25	411
5:50 PM	3	0	1	0	0	0	0	0	0	8	0	0	4	6	0	0	22	388
5:55 PM	3	0	5	0	0	0	0	0	0	9	0	0	6	3	0	0	26	389

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	0	100	0	0	0	0	0	0	136	32	0	44	148	0	0	488
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	8	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

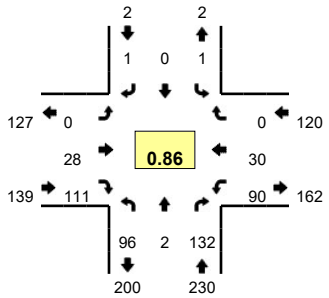
Type of peak hour being reported: Intersection Peak

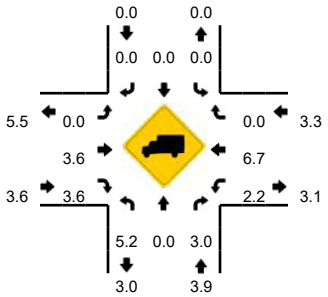
Method for determining peak hour: Total Entering Volume

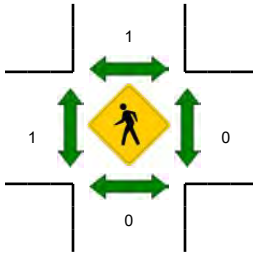
LOCATION: B5 - Barton†Rd -- Brace†Rd
CITY/STATE: Placer, CA

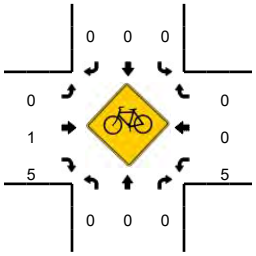
QC JOB #: 14088507
DATE: Sat, Jan 28 2017

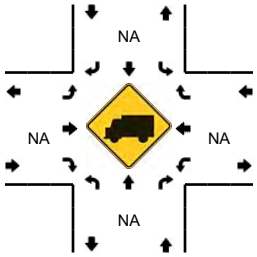
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:40 PM -- 12:55 PM

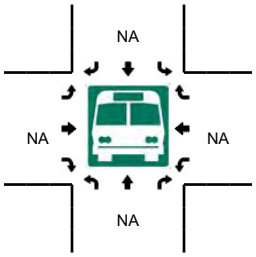












5-Min Count Period Beginning At	B5 - Barton†Rd (Northbound)				B5 - Barton†Rd (Southbound)				Brace†Rd (Eastbound)				Brace†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	6	0	7	0	0	0	0	0	0	3	7	0	7	1	0	0	31	
11:05 AM	13	0	8	0	0	0	0	0	0	3	10	0	4	6	0	0	44	
11:10 AM	9	0	6	0	0	0	0	0	0	3	7	0	8	2	0	0	35	
11:15 AM	8	0	5	0	0	0	0	0	0	2	10	0	7	2	0	0	34	
11:20 AM	4	0	4	0	0	0	0	0	0	3	7	0	10	4	0	0	32	
11:25 AM	16	0	8	0	0	0	0	0	0	5	7	0	8	3	0	0	47	
11:30 AM	1	0	11	0	0	0	0	0	0	1	8	0	4	3	0	0	28	
11:35 AM	11	0	4	0	0	0	0	0	0	3	4	0	5	5	0	0	32	
11:40 AM	11	0	2	0	0	0	0	0	0	2	14	0	7	2	0	0	38	
11:45 AM	11	0	14	0	0	0	0	0	0	2	8	0	6	2	0	0	43	
11:50 AM	12	0	8	0	0	0	0	0	0	1	6	0	8	2	0	0	37	
11:55 AM	7	0	3	0	0	0	0	0	0	1	6	0	8	1	0	0	26	427
12:00 PM	9	0	8	0	0	0	0	0	0	0	7	0	10	0	0	0	34	430
12:05 PM	5	0	12	0	0	0	0	0	0	4	10	0	8	3	0	0	42	428
12:10 PM	11	0	6	0	0	0	0	0	0	4	5	0	11	3	0	0	40	433
12:15 PM	11	0	8	0	0	0	0	0	0	4	10	0	1	5	0	0	39	438
12:20 PM	4	1	18	0	1	0	0	0	0	1	11	0	7	1	0	0	44	450
12:25 PM	8	0	7	0	0	0	0	0	0	0	9	0	13	2	0	0	39	442
12:30 PM	9	0	6	0	0	0	0	0	0	4	10	0	4	1	0	0	34	448
12:35 PM	8	0	9	0	0	0	0	0	0	1	6	0	9	2	0	0	35	451
12:40 PM	12	0	16	0	0	0	0	0	0	4	10	0	3	4	0	0	49	462
12:45 PM	7	1	18	0	0	0	1	0	0	1	16	0	8	4	0	0	56	475
12:50 PM	4	0	13	0	0	0	0	0	0	3	8	0	6	3	0	0	37	475
12:55 PM	8	0	11	0	0	0	0	0	0	2	9	0	9	2	0	1	42	491

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	92	4	188	0	0	0	4	0	0	32	136	0	68	44	0	0	568
Heavy Trucks	0	0	4		0	0	0		0	0	12		0	8	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	1		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

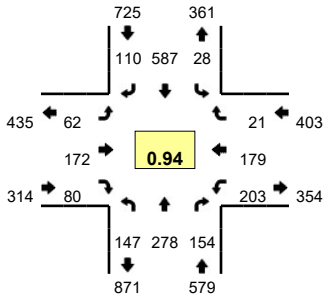
Type of peak hour being reported: Intersection Peak

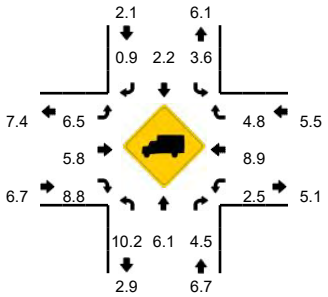
Method for determining peak hour: Total Entering Volume

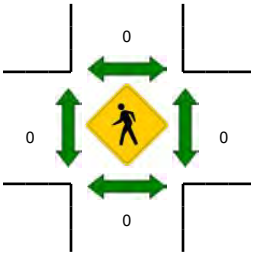
LOCATION: Sierra College Blvd -- Taylor Rd
CITY/STATE: Loomis, CA

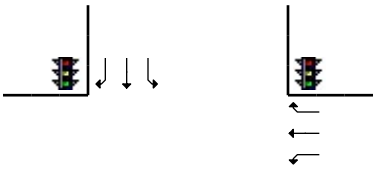
QC JOB #: 13963301
DATE: Thu, Nov 17 2016

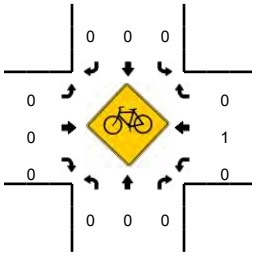
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

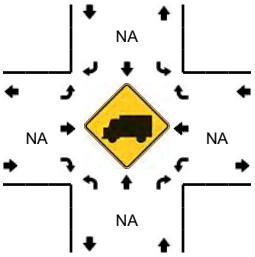


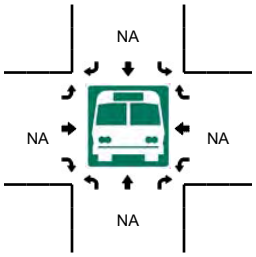












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Taylor Rd (Eastbound)				Taylor Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	15	11	0	2	20	3	0	2	10	5	0	16	8	1	0	99	
7:05 AM	10	16	12	0	1	35	7	0	1	12	1	0	7	6	2	0	110	
7:10 AM	8	12	14	0	0	45	5	0	4	15	4	0	12	9	0	0	128	
7:15 AM	11	20	13	0	2	51	11	0	3	6	3	0	15	9	0	0	144	
7:20 AM	14	15	12	0	2	32	4	0	4	11	4	0	10	13	0	0	121	
7:25 AM	9	22	12	0	0	38	3	0	2	20	4	0	6	10	0	0	126	
7:30 AM	10	14	19	0	4	46	2	0	3	20	4	0	20	21	4	0	167	
7:35 AM	11	19	8	0	3	43	5	0	7	21	8	0	16	12	1	0	154	
7:40 AM	22	26	7	0	0	51	11	0	4	10	7	0	15	18	6	0	177	
7:45 AM	13	21	16	0	1	63	15	0	5	13	7	0	10	15	2	0	181	
7:50 AM	8	22	12	0	5	53	9	0	9	14	7	0	23	15	1	0	178	
7:55 AM	10	26	16	0	4	46	12	0	4	17	7	0	11	13	0	0	166	1751
8:00 AM	4	29	18	1	3	47	15	0	8	7	3	0	26	19	1	0	181	1833
8:05 AM	17	28	10	0	1	36	5	0	6	19	6	0	16	12	4	0	160	1883
8:10 AM	12	25	17	0	0	68	12	0	2	9	7	0	14	8	1	0	175	1930
8:15 AM	12	29	9	0	1	37	9	0	4	15	12	0	19	20	0	0	167	1953
8:20 AM	15	26	11	0	1	48	10	0	3	14	8	0	9	13	1	0	159	1991
8:25 AM	12	13	11	0	5	49	5	0	7	13	4	0	24	13	0	0	156	2021
8:30 AM	13	23	12	1	2	28	7	0	2	12	8	0	11	12	5	0	136	1990
8:35 AM	9	20	11	0	3	42	5	0	4	11	7	0	21	13	2	0	148	1984
8:40 AM	1	17	10	0	4	33	7	0	9	12	7	0	9	7	1	0	117	1924
8:45 AM	22	23	9	0	0	21	9	0	2	15	9	0	13	14	0	0	137	1880
8:50 AM	5	11	10	0	4	66	12	0	1	14	11	0	7	10	5	0	156	1858
8:55 AM	11	21	17	0	1	38	4	0	3	11	8	0	9	8	2	0	133	1825

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	172	276	140	0	24	668	140	0	72	148	84	0	192	192	36	0	2144
Heavy Trucks	12	16	8		0	12	0		4	8	8		12	24	4		108
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

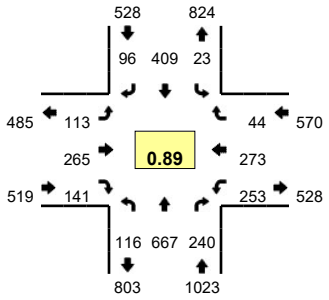
Type of peak hour being reported: Intersection Peak

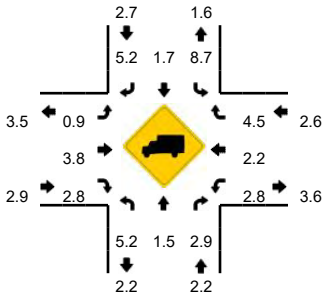
Method for determining peak hour: Total Entering Volume

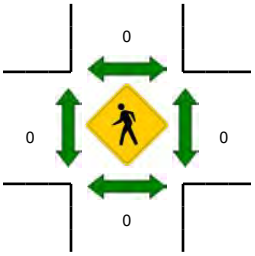
LOCATION: Sierra College Blvd -- Taylor Rd
CITY/STATE: Loomis, CA

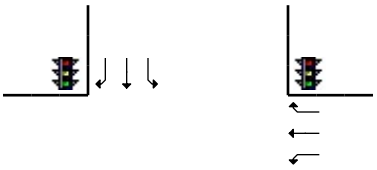
QC JOB #: 13963302
DATE: Thu, Nov 17 2016

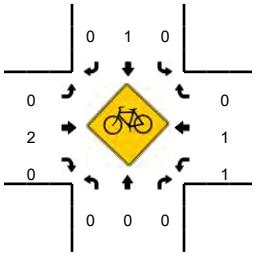
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

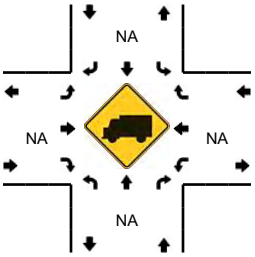


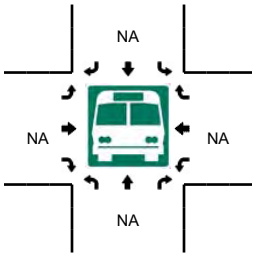












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Taylor Rd (Eastbound)				Taylor Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	17	40	19	0	3	21	7	0	9	26	13	0	19	23	4	0	201	
4:05 PM	13	29	16	0	3	39	3	0	9	26	12	0	20	21	3	0	194	
4:10 PM	7	42	21	1	2	46	5	0	10	26	15	0	26	18	3	0	222	
4:15 PM	10	55	23	0	1	38	5	0	14	33	10	0	11	16	3	0	219	
4:20 PM	7	56	25	1	1	28	6	0	10	29	15	1	22	17	2	0	220	
4:25 PM	23	57	23	0	2	22	9	0	9	22	8	0	16	22	0	0	213	
4:30 PM	10	43	26	1	1	22	7	0	14	24	13	0	29	18	1	0	209	
4:35 PM	9	51	19	0	2	18	3	0	12	21	17	0	33	15	3	0	203	
4:40 PM	15	45	24	0	1	37	6	0	8	25	13	0	28	21	3	0	226	
4:45 PM	7	63	12	0	1	30	10	0	5	24	10	0	17	39	2	0	220	
4:50 PM	14	35	18	0	6	27	5	0	6	20	7	0	14	16	2	0	170	
4:55 PM	12	73	20	0	2	35	5	0	9	14	7	0	13	21	5	0	216	2513
5:00 PM	4	39	19	0	2	36	11	0	11	21	13	0	18	27	3	0	204	2516
5:05 PM	7	68	16	0	4	30	8	0	7	37	19	0	22	24	3	0	245	2567
5:10 PM	11	49	25	0	2	37	8	0	21	12	18	0	34	30	6	0	253	2598
5:15 PM	7	76	28	0	0	28	10	0	16	26	5	0	18	26	7	0	247	2626
5:20 PM	14	60	23	0	0	38	11	0	8	24	9	0	21	16	3	0	227	2633
5:25 PM	6	57	15	0	1	57	13	0	4	20	11	0	16	16	2	0	218	2638
5:30 PM	10	51	21	0	2	36	6	0	6	21	12	0	19	22	5	0	211	2640
5:35 PM	8	52	19	1	1	28	13	0	6	29	13	1	11	16	2	0	200	2637
5:40 PM	13	49	20	0	3	28	3	0	14	21	5	0	14	15	3	0	188	2599
5:45 PM	8	48	18	0	1	21	4	0	9	16	9	0	21	13	2	0	170	2549
5:50 PM	7	42	20	0	3	39	7	1	4	28	8	0	7	20	1	0	187	2566
5:55 PM	10	51	23	0	5	34	6	0	10	12	6	0	19	8	2	0	186	2536

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	100	772	276	0	24	380	104	0	176	300	168	0	296	320	64	0	2980
Heavy Trucks	4	12	4		0	4	8		4	12	0		4	8	4		64
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

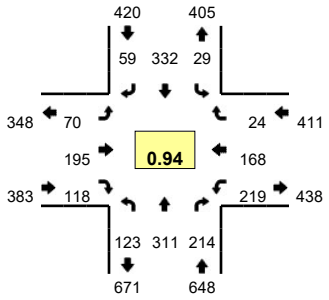
LOCATION: B10 - Sierra†College†Blvd -- Taylor†Rd

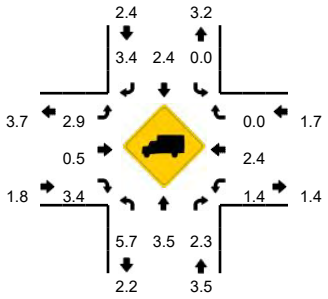
CITY/STATE: Loomis, CA

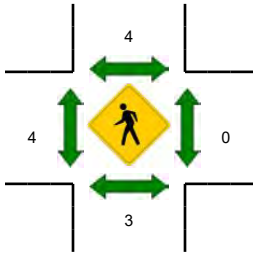
QC JOB #: 14088501

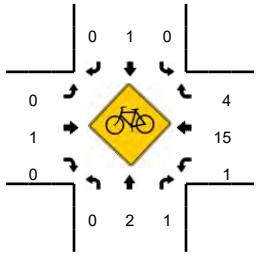
DATE: Sat, Jan 28 2017

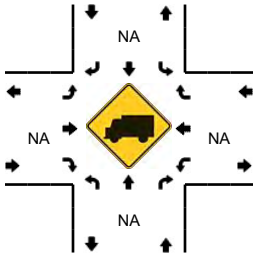
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:10 PM -- 12:25 PM

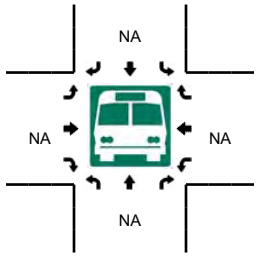












5-Min Count Period Beginning At	B10 - Sierra†College†Blvd (Northbound)				B10 - Sierra†College†Blvd (Southbound)				Taylor†Rd (Eastbound)				Taylor†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	10	19	13	1	5	15	3	0	5	14	7	0	11	10	3	0	116	
11:05 AM	8	38	8	2	2	28	6	0	4	15	6	0	12	25	1	0	155	
11:10 AM	12	20	18	0	3	31	4	0	0	11	4	0	15	17	0	0	135	
11:15 AM	4	17	11	0	2	26	4	0	2	16	5	0	14	16	2	0	119	
11:20 AM	14	30	12	1	1	23	3	0	11	17	7	0	17	17	0	0	153	
11:25 AM	9	20	11	0	1	37	3	0	4	15	8	0	12	9	0	0	129	
11:30 AM	6	24	27	0	3	27	2	0	5	18	4	0	12	15	2	0	145	
11:35 AM	5	24	9	0	2	36	3	0	0	13	6	0	17	11	3	0	129	
11:40 AM	9	20	15	0	0	28	2	0	8	20	12	0	25	17	3	0	159	
11:45 AM	7	24	19	0	3	38	4	0	4	13	3	0	19	10	5	0	149	
11:50 AM	14	27	21	0	2	32	4	0	2	11	11	0	6	10	1	0	141	
11:55 AM	13	14	14	0	4	27	1	0	6	18	8	0	16	14	2	0	137	1667
12:00 PM	10	28	22	0	3	30	3	0	1	16	8	0	6	13	6	0	146	1697
12:05 PM	8	18	16	0	3	20	3	0	9	18	9	0	21	14	2	0	141	1683
12:10 PM	21	29	16	1	5	22	4	0	4	15	8	0	35	18	2	0	180	1728
12:15 PM	6	33	10	0	3	37	6	0	4	11	7	0	24	15	1	0	157	1766
12:20 PM	5	25	23	1	1	24	6	0	12	21	11	0	12	18	1	0	160	1773
12:25 PM	14	23	19	0	6	28	6	0	5	21	9	0	16	9	2	0	158	1802
12:30 PM	8	33	17	0	1	33	6	0	7	19	10	0	14	12	0	0	160	1817
12:35 PM	11	18	15	0	1	24	6	0	8	16	7	0	26	17	4	0	153	1841
12:40 PM	4	23	15	0	1	31	4	0	6	13	17	0	20	9	1	0	144	1826
12:45 PM	17	30	27	0	2	21	7	0	5	17	19	0	14	14	1	0	174	1851
12:50 PM	8	27	14	0	2	39	3	0	2	12	4	0	11	12	3	0	137	1847
12:55 PM	9	24	20	0	1	23	5	0	7	16	9	0	20	17	1	0	152	1862

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	128	348	196	8	36	332	64	0	80	188	104	0	284	204	16	0	1988
Heavy Trucks	4	4	4		0	4	4		4	0	0		0	4	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	2	0		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

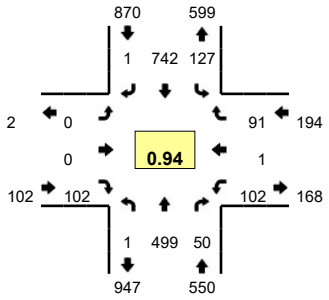
Type of peak hour being reported: Intersection Peak

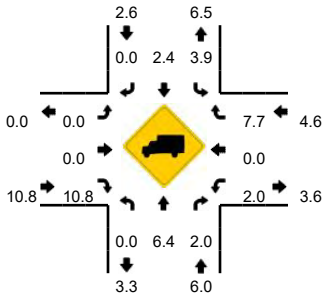
Method for determining peak hour: Total Entering Volume

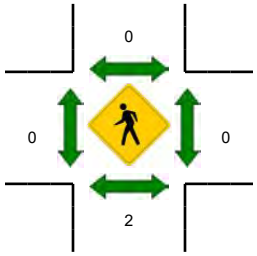
LOCATION: Sierra College Blvd -- Brace Rd
CITY/STATE: Loomis, CA

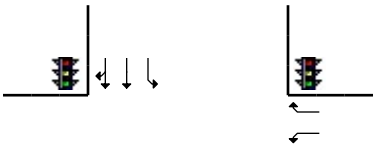
QC JOB #: 13963303
DATE: Thu, Nov 17 2016

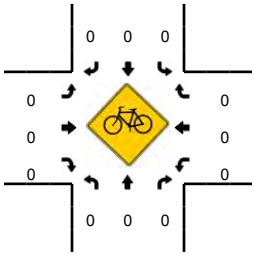
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

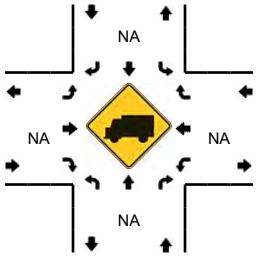


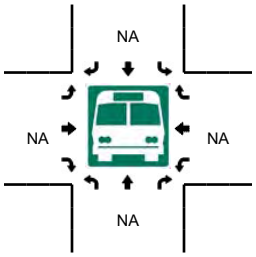












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Brace Rd (Eastbound)				Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	31	3	0	3	38	0	0	0	0	4	0	8	0	5	0	92	
7:05 AM	0	32	1	0	3	35	0	0	0	0	8	0	7	0	6	0	92	
7:10 AM	0	37	7	0	4	55	0	0	0	0	9	0	11	0	3	0	126	
7:15 AM	0	34	3	0	5	63	0	0	0	0	2	0	4	0	4	0	115	
7:20 AM	0	35	4	0	6	44	0	0	0	0	4	0	2	0	6	0	101	
7:25 AM	0	37	2	0	4	40	0	0	0	0	3	0	4	0	6	0	96	
7:30 AM	0	44	5	0	9	58	0	1	0	0	6	0	9	0	11	0	143	
7:35 AM	0	38	3	0	14	55	1	0	0	0	10	0	6	0	5	0	132	
7:40 AM	0	40	3	1	11	61	0	0	0	0	12	0	4	1	5	0	138	
7:45 AM	0	46	4	0	6	71	0	2	0	0	12	0	9	0	8	0	158	
7:50 AM	0	34	4	0	16	71	0	1	0	0	4	0	11	0	5	0	146	
7:55 AM	0	48	9	0	4	55	0	2	0	0	3	0	6	0	3	0	130	1469
8:00 AM	0	42	5	0	10	62	0	1	0	0	9	0	14	0	13	0	156	1533
8:05 AM	0	53	5	0	7	59	0	0	0	0	11	0	7	0	9	0	151	1592
8:10 AM	0	39	2	0	13	63	0	1	0	0	8	0	12	0	12	0	150	1616
8:15 AM	0	45	2	0	8	67	0	0	0	0	10	0	5	0	10	0	147	1648
8:20 AM	0	44	3	0	13	54	0	0	0	0	7	0	5	0	6	0	132	1679
8:25 AM	0	26	5	0	7	66	0	1	0	0	10	0	14	0	4	0	133	1716
8:30 AM	0	50	2	0	8	45	0	0	0	0	15	0	13	0	2	0	135	1708
8:35 AM	0	43	5	0	5	62	0	0	0	0	6	0	15	0	0	0	136	1712
8:40 AM	0	32	7	0	2	39	0	1	0	0	5	0	7	1	5	0	99	1673
8:45 AM	0	33	7	0	11	38	0	0	0	0	6	0	7	0	7	0	109	1624
8:50 AM	0	29	6	0	11	69	0	1	0	0	3	0	6	0	2	0	127	1605
8:55 AM	0	41	3	0	2	49	0	2	0	0	0	0	8	0	4	0	109	1584

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	536	48	0	120	736	0	8	0	0	112	0	132	0	136	0	1828
Heavy Trucks	0	44	0		4	16	0		0	0	24		0	0	4		92
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

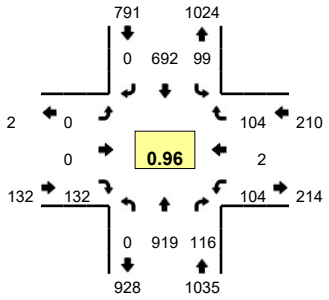
Type of peak hour being reported: Intersection Peak

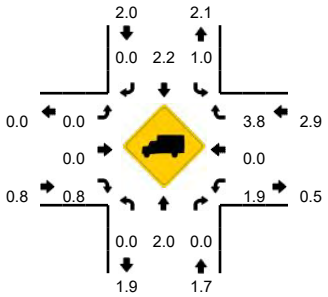
Method for determining peak hour: Total Entering Volume

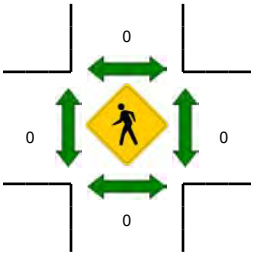
LOCATION: Sierra College Blvd -- Brace Rd
CITY/STATE: Loomis, CA

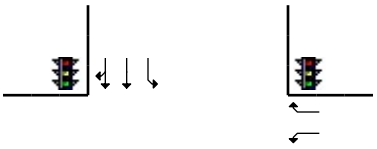
QC JOB #: 13963304
DATE: Thu, Nov 17 2016

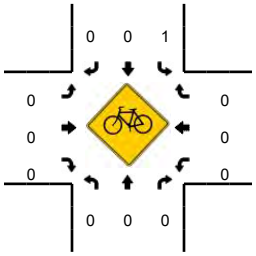
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

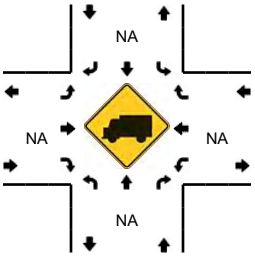


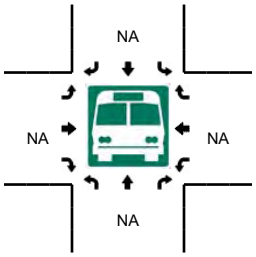












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Brace Rd (Eastbound)				Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	64	12	0	8	43	0	0	0	0	9	0	10	0	10	0	156	
4:05 PM	0	60	10	0	10	52	0	0	0	0	18	0	10	0	5	0	165	
4:10 PM	0	60	5	0	9	76	0	0	0	0	12	0	8	0	7	0	177	
4:15 PM	0	72	14	0	7	43	0	1	0	0	10	0	13	0	15	0	175	
4:20 PM	0	82	15	0	8	57	0	1	0	0	4	0	9	1	13	0	190	
4:25 PM	0	79	11	0	5	30	0	1	0	0	11	0	11	0	11	0	159	
4:30 PM	0	78	9	0	16	61	0	0	0	0	14	0	8	0	7	0	193	
4:35 PM	0	59	8	0	12	45	0	0	0	0	11	0	10	0	17	0	162	
4:40 PM	0	87	7	0	8	70	0	0	0	0	18	0	4	1	8	0	203	
4:45 PM	0	63	8	0	9	52	0	0	0	0	10	0	12	0	10	0	164	
4:50 PM	0	68	17	0	6	47	0	0	0	0	10	0	10	0	7	0	165	
4:55 PM	0	89	11	0	6	47	0	0	0	0	10	0	6	0	15	0	184	2093
5:00 PM	0	58	6	0	9	57	0	0	0	0	13	0	13	0	10	0	166	2103
5:05 PM	0	89	7	0	10	59	0	1	0	0	11	0	7	0	9	0	193	2131
5:10 PM	0	62	4	0	10	76	0	0	0	0	10	0	9	0	11	0	182	2136
5:15 PM	0	92	10	0	10	42	0	0	0	0	8	0	9	1	16	0	188	2149
5:20 PM	0	79	10	0	3	60	0	0	0	0	9	0	9	0	8	0	178	2137
5:25 PM	0	71	15	0	8	76	0	0	0	0	7	0	11	0	1	0	189	2167
5:30 PM	0	71	10	0	7	63	0	0	0	0	12	0	6	0	6	0	175	2149
5:35 PM	0	90	11	0	12	43	0	0	0	0	14	0	8	0	3	0	181	2168
5:40 PM	0	62	9	0	4	41	0	0	0	0	3	0	6	0	8	0	133	2098
5:45 PM	0	67	11	0	3	42	0	0	0	0	5	0	6	0	5	0	139	2073
5:50 PM	0	73	7	0	6	56	0	0	0	0	6	0	8	0	6	0	162	2070
5:55 PM	0	64	9	0	4	52	0	0	0	0	6	0	14	0	7	0	156	2042

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	972	84	0	120	708	0	4	0	0	116	0	100	4	144	0	2252
Heavy Trucks	0	16	0		0	12	0		0	0	0		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

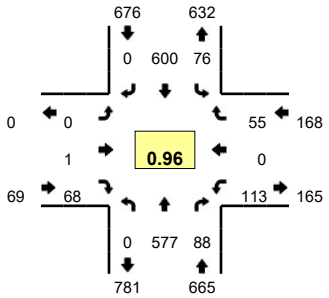
Type of peak hour being reported: Intersection Peak

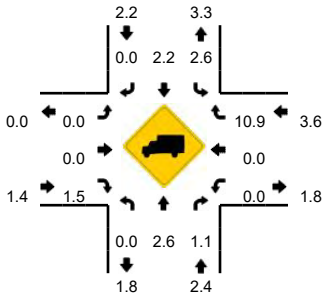
Method for determining peak hour: Total Entering Volume

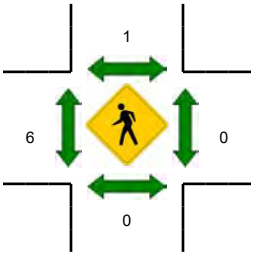
LOCATION: B9 - Sierra†College†Blvd -- Brace†Rd
CITY/STATE: Loomis, CA

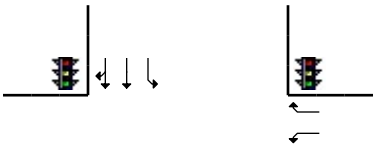
QC JOB #: 14088502
DATE: Sat, Jan 28 2017

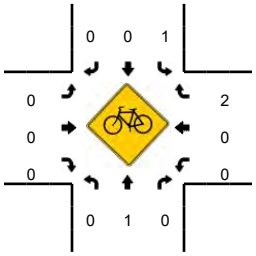
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:05 PM -- 12:20 PM

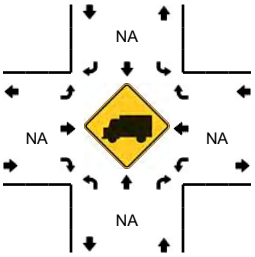


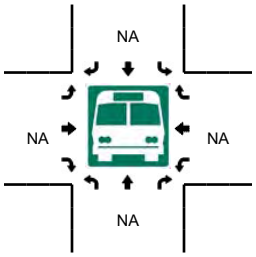












5-Min Count Period Beginning At	B9 - Sierra†College†Blvd (Northbound)				B9 - Sierra†College†Blvd (Southbound)				Brace†Rd (Eastbound)				Brace†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	40	8	0	5	30	0	2	0	0	1	0	9	0	4	0	99	
11:05 AM	0	46	11	0	4	40	0	1	0	0	4	0	3	0	6	0	115	
11:10 AM	0	39	6	0	6	45	1	0	0	0	7	0	9	0	8	0	121	
11:15 AM	0	28	13	0	8	39	0	0	0	0	3	0	16	0	4	0	111	
11:20 AM	0	49	10	0	3	48	1	0	0	0	3	0	6	0	6	0	126	
11:25 AM	0	41	5	0	7	50	1	0	0	0	3	0	6	0	3	0	116	
11:30 AM	0	49	9	0	5	41	0	0	0	0	4	0	7	0	7	0	122	
11:35 AM	0	34	4	0	6	49	0	0	0	0	10	0	16	0	4	0	123	
11:40 AM	0	47	8	0	4	65	0	0	0	0	1	0	11	0	4	0	140	
11:45 AM	0	39	5	0	4	56	0	1	0	0	5	0	5	0	6	0	121	
11:50 AM	0	53	5	0	5	44	0	0	1	0	4	0	9	0	7	0	128	
11:55 AM	0	48	6	0	4	47	1	0	0	0	6	0	5	0	2	0	119	1441
12:00 PM	0	48	6	0	4	38	0	0	0	0	4	0	12	0	6	0	118	1460
12:05 PM	0	54	7	0	7	52	0	0	0	0	5	0	9	0	8	0	142	1487
12:10 PM	0	45	5	0	4	61	0	0	0	0	1	0	16	0	5	0	137	1503
12:15 PM	0	36	9	0	2	65	0	0	0	0	8	0	8	0	5	0	133	1525
12:20 PM	0	51	7	0	7	38	0	0	0	0	8	0	5	0	3	0	119	1518
12:25 PM	0	48	7	0	7	51	0	0	0	0	4	0	16	0	6	0	139	1541
12:30 PM	0	54	4	0	8	43	0	0	0	0	6	0	7	0	7	0	129	1548
12:35 PM	0	43	11	0	3	59	0	0	0	1	4	0	9	0	2	0	132	1557
12:40 PM	0	36	3	0	7	53	0	0	0	0	10	0	9	0	4	0	122	1539
12:45 PM	0	66	10	0	8	50	0	0	0	0	6	0	4	0	5	0	149	1567
12:50 PM	0	45	7	0	12	40	0	0	0	0	4	0	11	0	2	0	121	1560
12:55 PM	0	51	12	0	7	50	0	0	0	0	8	0	7	0	2	0	137	1578

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	540	84	0	52	712	0	0	0	0	56	0	132	0	72	0	1648
Heavy Trucks	0	16	0		0	0	0		0	0	4		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

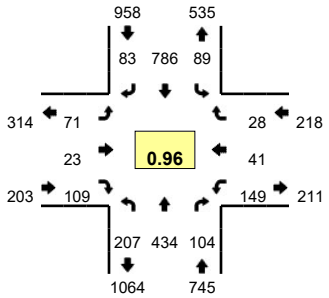
Type of peak hour being reported: Intersection Peak

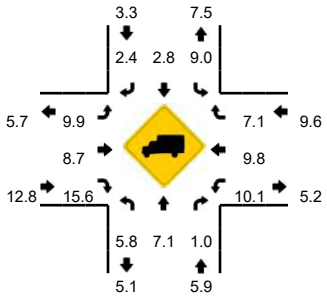
Method for determining peak hour: Total Entering Volume

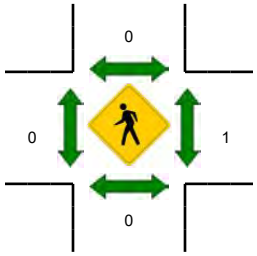
LOCATION: Sierra College Blvd -- Granite Dr
CITY/STATE: Rocklin, CA

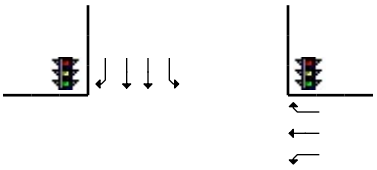
QC JOB #: 13963305
DATE: Thu, Nov 17 2016

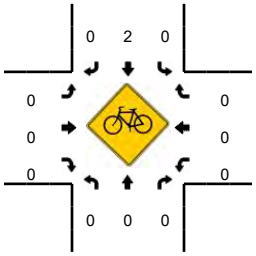
Peak-Hour: 7:35 AM -- 8:35 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

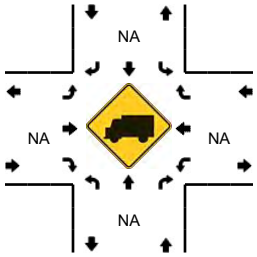


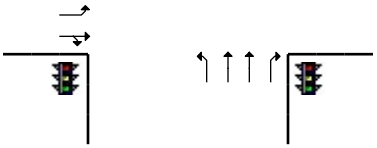


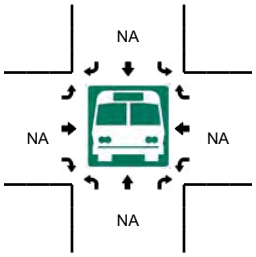












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Granite Dr (Eastbound)				Granite Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	17	23	11	3	3	37	7	0	4	1	12	0	14	2	3	0	137	
7:05 AM	9	28	9	1	9	36	6	1	3	1	9	1	19	0	1	0	133	
7:10 AM	10	32	9	2	4	59	5	0	8	2	4	0	11	4	2	0	152	
7:15 AM	10	32	8	3	7	58	4	0	4	0	4	0	11	2	6	0	149	
7:20 AM	12	38	8	2	6	53	1	1	1	2	6	1	9	2	3	0	145	
7:25 AM	11	20	13	4	1	27	4	1	7	2	9	1	11	3	2	0	116	
7:30 AM	18	38	7	2	8	59	2	0	4	3	5	1	12	0	4	0	163	
7:35 AM	11	39	10	1	9	74	7	0	6	1	7	0	13	0	2	0	180	
7:40 AM	19	41	13	0	6	56	7	0	6	4	7	0	12	3	0	0	174	
7:45 AM	22	37	8	5	4	77	10	0	8	2	9	0	11	4	3	0	200	
7:50 AM	23	31	6	4	8	73	5	1	5	2	9	1	8	3	2	0	181	
7:55 AM	19	37	3	1	5	58	8	0	5	1	12	0	9	8	3	0	169	1899
8:00 AM	19	39	11	0	5	63	8	0	2	2	6	0	16	4	2	0	177	1939
8:05 AM	13	40	11	1	7	55	8	3	7	1	8	0	11	5	0	0	170	1976
8:10 AM	10	30	14	0	6	70	7	1	8	2	11	0	11	3	3	0	176	2000
8:15 AM	16	42	8	1	7	69	6	0	3	1	9	0	19	2	4	0	187	2038
8:20 AM	16	29	7	2	8	54	6	0	4	2	10	0	14	2	3	0	157	2050
8:25 AM	10	26	9	3	8	68	6	0	7	4	10	1	14	3	3	0	172	2106
8:30 AM	9	43	4	2	11	69	5	0	7	1	11	1	11	4	3	0	181	2124
8:35 AM	9	38	9	0	4	71	2	1	5	1	14	0	14	2	1	0	171	2115
8:40 AM	14	28	7	0	5	49	3	1	7	3	25	1	9	1	2	0	155	2096
8:45 AM	15	35	14	2	3	40	6	3	0	1	7	1	11	4	1	0	143	2039
8:50 AM	18	34	8	1	5	49	7	0	4	4	14	0	9	4	2	0	159	2017
8:55 AM	14	41	2	1	6	53	4	0	1	2	9	0	16	4	3	0	156	2004

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	256	436	108	36	72	824	88	4	76	32	100	4	124	40	20	0	2220
Heavy Trucks	20	20	0		16	16	4		8	4	16		8	4	0		116
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

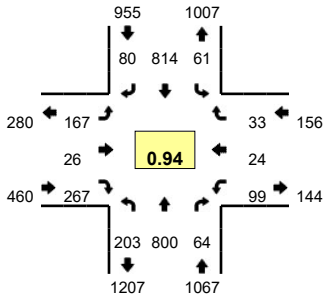
Type of peak hour being reported: Intersection Peak

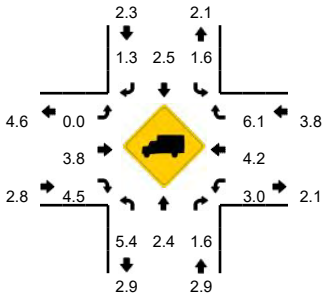
Method for determining peak hour: Total Entering Volume

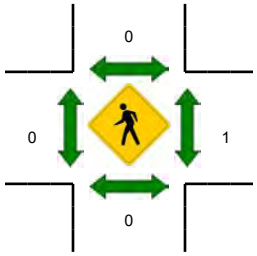
LOCATION: Sierra College Blvd -- Granite Dr
CITY/STATE: Rocklin, CA

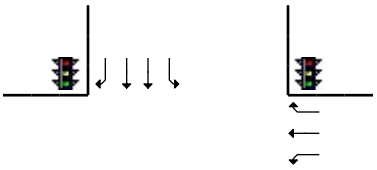
QC JOB #: 13963306
DATE: Thu, Nov 17 2016

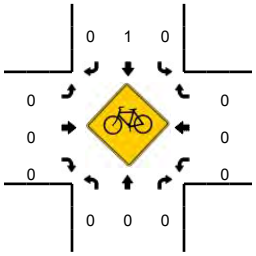
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

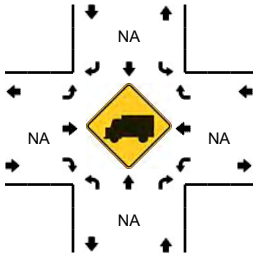


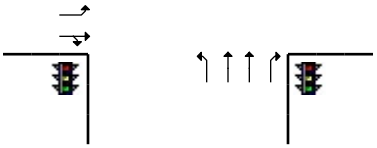


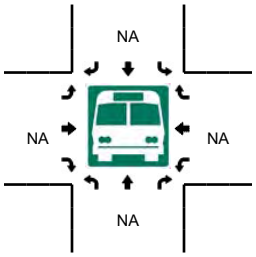












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Granite Dr (Eastbound)				Granite Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	45	1	2	1	56	7	0	11	2	17	2	8	2	4	0	173	
4:05 PM	16	55	8	1	6	66	1	2	11	3	19	1	7	0	3	0	199	
4:10 PM	13	72	5	2	3	99	7	0	6	2	21	0	2	2	3	0	237	
4:15 PM	16	90	6	5	4	55	5	1	11	1	24	0	4	1	3	0	226	
4:20 PM	21	63	5	3	1	56	7	0	10	7	19	0	13	2	8	0	215	
4:25 PM	6	63	5	1	2	67	8	0	20	3	17	0	9	2	1	0	204	
4:30 PM	15	56	10	2	5	52	8	1	12	1	18	0	5	0	1	0	186	
4:35 PM	10	73	9	1	5	61	8	0	12	2	19	0	2	2	3	1	208	
4:40 PM	16	55	5	2	4	75	11	0	12	4	22	0	10	2	4	0	222	
4:45 PM	12	66	2	4	4	65	3	1	15	1	14	0	11	1	3	0	202	
4:50 PM	11	68	5	4	5	60	6	1	11	4	15	0	10	2	2	0	204	
4:55 PM	7	68	1	1	2	61	5	0	14	0	29	0	12	0	5	0	205	2481
5:00 PM	20	82	3	1	4	74	5	0	9	0	32	0	4	2	3	0	239	2547
5:05 PM	14	55	9	2	1	69	6	0	13	2	27	0	7	3	2	0	210	2558
5:10 PM	20	72	7	4	6	77	6	1	16	4	27	0	10	4	1	0	255	2576
5:15 PM	17	67	6	1	1	67	6	0	15	3	24	0	7	1	4	0	219	2569
5:20 PM	19	60	5	4	9	69	6	2	11	2	22	0	9	5	2	0	225	2579
5:25 PM	16	61	9	1	6	72	9	1	20	3	15	1	7	2	2	0	225	2600
5:30 PM	13	73	3	3	6	64	9	2	18	1	21	0	9	0	2	0	224	2638
5:35 PM	9	59	9	1	7	62	4	0	8	3	11	0	9	2	1	0	185	2615
5:40 PM	10	67	12	3	2	47	4	0	9	3	11	2	8	1	2	0	181	2574
5:45 PM	8	66	7	1	1	52	3	0	10	1	16	0	6	1	4	0	176	2548
5:50 PM	8	68	7	1	5	54	6	1	6	1	20	0	12	4	2	0	195	2539
5:55 PM	7	50	5	2	4	54	7	1	21	2	11	0	12	5	3	0	184	2518

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	216	836	76	28	44	880	68	4	152	24	344	0	84	36	24	0	2816
Heavy Trucks	16	12	0		0	16	0		0	4	16		0	4	4		72
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

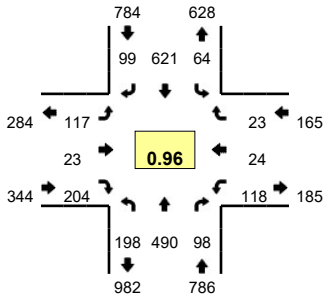
Type of peak hour being reported: Intersection Peak

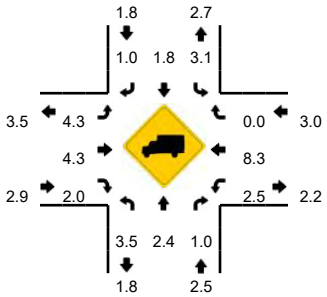
Method for determining peak hour: Total Entering Volume

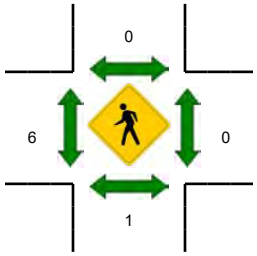
LOCATION: B7 - Sierra†College†Blvd -- Granite†Drive
CITY/STATE: Rocklin, CA

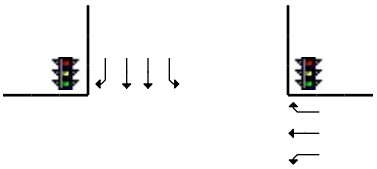
QC JOB #: 14088503
DATE: Sat, Jan 28 2017

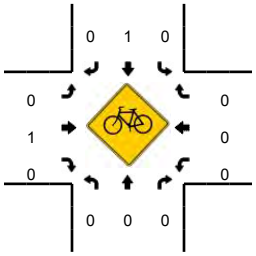
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:15 PM -- 12:30 PM

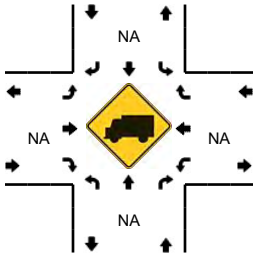


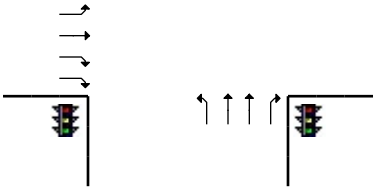


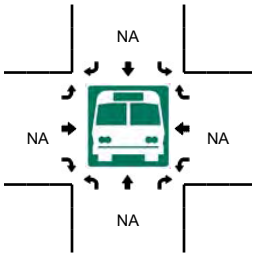












5-Min Count Period Beginning At	B7 - Sierra†College†Blvd (Northbound)				B7 - Sierra†College†Blvd (Southbound)				Granite†Drive (Eastbound)				Granite†Drive (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	12	34	1	3	6	31	2	0	8	3	12	0	7	1	4	0	124	
11:05 AM	5	35	10	1	2	41	4	0	12	3	15	0	16	0	3	0	147	
11:10 AM	6	41	11	4	7	47	2	0	3	3	6	0	11	3	0	0	144	
11:15 AM	11	19	7	1	2	41	8	0	8	0	14	0	12	2	6	0	131	
11:20 AM	12	46	5	3	6	49	9	0	12	2	10	0	8	3	3	0	168	
11:25 AM	12	39	10	3	5	37	8	0	9	1	16	0	9	3	1	0	153	
11:30 AM	9	29	4	4	2	54	8	0	13	2	9	0	11	1	3	0	149	
11:35 AM	14	31	11	2	9	54	13	0	9	1	13	0	10	2	2	0	171	
11:40 AM	11	33	6	7	6	56	9	0	11	1	19	0	9	3	1	0	172	
11:45 AM	12	27	7	1	3	57	6	0	13	1	11	0	18	2	2	0	160	
11:50 AM	16	42	4	2	5	42	4	0	14	4	13	0	15	1	2	0	164	
11:55 AM	21	37	6	2	5	44	6	0	5	3	9	0	8	2	2	0	150	1833
12:00 PM	12	45	6	2	3	50	10	0	9	4	16	0	15	2	2	0	176	1885
12:05 PM	13	45	10	3	2	56	9	0	11	2	16	0	7	2	3	0	179	1917
12:10 PM	8	30	8	2	6	44	13	0	10	0	22	0	5	4	1	0	153	1926
12:15 PM	15	44	6	2	5	75	9	0	4	1	11	2	12	1	2	0	189	1984
12:20 PM	19	36	8	3	9	38	7	0	13	4	22	0	11	1	2	0	173	1989
12:25 PM	11	47	9	0	2	62	8	0	5	3	12	0	12	3	3	0	177	2013
12:30 PM	12	35	9	5	2	43	6	0	10	2	12	0	10	4	1	0	151	2015
12:35 PM	12	37	10	6	8	50	10	0	8	0	23	0	8	3	5	0	180	2024
12:40 PM	12	43	6	3	6	64	8	0	7	4	13	0	8	0	1	0	175	2027
12:45 PM	12	40	8	4	5	48	7	0	18	1	20	0	9	2	2	0	176	2043
12:50 PM	15	50	10	4	7	46	5	0	8	0	13	0	7	1	1	0	167	2046
12:55 PM	18	38	8	5	9	45	7	0	12	2	24	0	14	1	0	0	183	2079

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	508	92	20	64	700	96	0	88	32	180	8	140	20	28	0	2156
Heavy Trucks	4	16	0		4	8	0		0	0	4		4	4	0		44
Pedestrians		4				0				12				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

Location: Sierra College Blvd -- I-80 WB Ramps
Date: 1/28/2017
Site Code: 14088504

	Sierra College Blvd Southbound					I-80 WB Ramps Westbound					Sierra College Blvd Northbound					On Ramp Northeast Bound					I-80 WB Ramps Eastbound				
Start Time	Right	Bear Right	Thru	Left	U-Turns	Right	Thru	Bear Left	Left	U-Turns	Right	Thru	Left	Hard Left	U-Turns	Hard Right	Bear Right	Bear Left	Hard Left	U-Turns	Hard Right	Right	Thru	Left	U-Turns
11:00 AM	5	13	30	0	0	17	7	0	28	0	16	38	16	0	0	0	0	0	0	0	8	3	0	1	0
11:05 AM	5	21	43	0	0	9	13	0	17	0	20	50	26	0	0	0	0	0	0	0	7	6	0	1	0
11:10 AM	4	23	46	0	0	14	12	0	22	0	15	37	16	0	0	0	0	0	0	0	6	15	0	8	0
11:15 AM	5	19	34	0	0	18	2	0	33	0	15	31	16	0	0	0	0	0	0	0	6	15	0	3	0
11:20 AM	10	19	45	0	0	18	7	0	44	0	11	42	25	0	0	0	0	0	0	0	5	6	0	3	0
11:25 AM	4	18	48	0	0	20	8	0	29	0	9	32	11	0	0	0	0	0	0	0	7	17	0	7	0
11:30 AM	4	17	39	0	0	18	11	0	28	0	17	31	17	0	0	0	0	0	0	0	7	11	0	3	0
11:35 AM	4	28	55	0	0	13	10	0	24	0	15	34	19	0	0	0	0	0	0	0	10	5	0	3	0
11:40 AM	7	24	47	0	0	14	11	0	41	0	18	44	13	0	0	0	0	0	0	0	10	14	0	5	0
11:45 AM	6	28	59	0	0	12	12	0	17	0	13	36	24	0	0	0	0	0	0	0	5	15	0	4	0
11:50 AM	7	19	40	0	0	7	15	0	23	0	22	47	27	0	0	0	0	0	0	0	13	17	0	2	0
11:55 AM	7	16	45	0	0	10	9	0	40	0	17	46	26	0	0	0	0	0	0	0	7	17	0	3	0
12:00 PM	2	30	51	0	0	16	12	0	17	0	17	49	20	0	0	0	0	0	0	0	8	8	0	2	0
12:05 PM	3	24	39	0	0	19	16	0	41	0	26	42	21	0	0	0	0	0	0	0	12	11	0	11	0
12:10 PM	6	29	44	0	0	7	13	0	30	0	21	37	31	0	0	0	0	0	0	0	5	13	0	6	0
12:15 PM	11	31	64	0	0	13	14	0	31	0	19	42	29	0	0	0	0	0	0	0	7	12	0	6	0
12:20 PM	1	18	33	0	0	11	14	0	46	0	19	53	33	0	0	0	0	0	0	0	12	14	0	7	0
12:25 PM	11	27	47	0	0	9	17	0	49	0	20	42	28	0	0	0	0	0	0	0	4	12	0	8	0
12:30 PM	6	25	44	0	0	15	11	0	26	0	20	46	29	0	0	0	0	0	0	0	16	13	0	4	0
12:35 PM	10	22	40	0	0	11	10	0	44	0	17	51	31	0	0	0	0	0	0	0	14	9	0	7	0
12:40 PM	11	33	42	0	0	13	7	0	26	0	23	41	25	0	0	0	0	0	0	0	11	11	0	6	0
12:45 PM	7	26	58	0	0	18	9	0	20	0	18	46	21	0	0	0	0	0	0	0	11	15	0	11	0
12:50 PM	6	18	36	0	0	15	15	0	35	0	23	41	27	0	0	0	0	0	0	0	10	21	1	6	0
12:55 PM	8	29	42	0	0	22	11	0	29	0	15	53	36	0	0	0	0	0	0	0	11	21	0	5	0
Totals	**151**	**570**	**1105**	**0**	**0**	**362**	**270**	**0**	**760**	**0**	**439**	**1049**	**580**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**214**	**304**	**0**	**122**	**0**

Peak Hour: 12:00 PM - 1:00 PM
Peak 15-Min: 12:15 PM - 12:30 PM
PHF: 0.958

	Right	Bear Right	Thru	Left	U-Turns	Right	Thru	Bear Left	Left	U-Turns	Right	Thru	Left	Hard Left	U-Turns	Hard Right	Bear Right	Bear Left	Hard Left	U-Turns	Hard Right	Right	Thru	Left	U-Turns
Total Volume	82	312	540	0	0	169	149	0	394	0	238	543	331	0	0	0	0	0	0	0	121	160	1	79	0
Total Trucks	0	6	16	0	0	11	1	0	8	0	8	12	0	0	0	0	0	0	0	0	0	1	0	0	0
Truck %	0%	2%	3%			7%	1%		2%		3%	2%	0%								0%	1%	0%	0%	

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

Location: Sierra College Blvd -- I-80 WB Ramps
Start Date: 11/17/2016
Site Code: 13963307

	Sierra College Blvd Southbound					I-80 WB Ramps Westbound					Sierra College Blvd Northbound					I-80 On-Ramp Northeastbound					I-80 WB Ramps Eastbound				
Start Time	Right	Right to I-80 On-Ramp	Thru	Left	Peds	Right	Thru	Left to I-80 On-Ramp	Left	Peds	Right	Thru	Left	Left to I-80 On-Ramp	Peds	Right to Sierra College Blvd	Right to I-80 WB Ramps	Left to Sierra College Blvd	Left to I-80 WB Ramps	Peds	Right to I-80 On-Ramp	Right	Thru	Left	Peds
07:00 AM	0	28	34	0	0	21	1	0	27	0	9	33	6	0	0	0	0	0	0	0	1	0	0	1	0
07:05 AM	0	21	35	0	0	20	1	0	37	0	12	27	5	0	0	0	0	0	0	0	0	0	0	1	0
07:10 AM	4	20	34	0	0	20	5	0	34	0	5	39	4	0	0	0	0	0	0	0	2	0	0	0	0
07:15 AM	3	22	56	0	0	12	5	0	34	0	13	44	4	0	0	0	0	0	0	0	3	2	0	0	0
07:20 AM	2	25	50	0	0	15	0	0	36	0	13	49	4	0	0	0	0	0	0	0	2	3	0	1	0
07:25 AM	0	17	35	0	0	21	4	0	56	0	10	35	4	0	0	0	0	0	0	0	2	3	0	0	0
07:30 AM	2	19	45	0	0	22	2	1	53	0	8	44	1	0	0	0	0	0	0	0	4	1	0	0	0
07:35 AM	3	33	48	0	0	19	3	0	53	0	7	39	5	0	0	0	0	0	0	0	0	1	0	0	0
07:40 AM	2	24	48	0	0	23	2	0	53	0	12	60	5	0	0	0	0	0	0	0	1	3	0	0	0
07:45 AM	1	31	58	0	0	27	8	0	50	0	15	52	5	0	0	0	0	0	0	0	1	1	0	0	0
07:50 AM	2	18	54	0	0	21	7	0	76	0	11	41	5	0	0	0	0	0	0	0	4	4	0	0	0
07:55 AM	1	34	52	0	0	23	3	0	64	0	23	44	4	0	0	0	0	0	0	0	4	2	0	0	0
08:00 AM	2	23	38	0	0	14	2	0	53	0	8	56	6	0	0	0	0	0	0	0	1	4	0	1	0
08:05 AM	6	36	48	0	0	17	3	0	30	0	9	50	4	0	0	0	0	0	0	0	0	2	0	0	0
08:10 AM	4	30	50	0	0	17	5	1	47	0	10	42	6	0	0	0	0	0	0	0	1	1	0	0	0
08:15 AM	1	26	61	0	0	25	6	0	45	0	10	50	7	0	0	0	0	0	0	0	1	6	0	0	0
08:20 AM	3	22	61	0	0	16	7	0	34	0	6	39	6	0	0	0	0	0	0	0	2	2	0	0	0
08:25 AM	6	25	67	0	0	15	7	0	44	0	6	44	4	0	0	0	0	0	0	0	1	5	0	0	0
08:30 AM	6	23	46	0	0	17	6	0	56	0	10	39	6	0	0	0	0	0	0	0	1	4	0	3	0
08:35 AM	4	35	65	0	0	11	8	0	30	0	10	39	10	0	0	0	0	0	0	0	4	6	0	1	0
08:40 AM	2	22	53	0	0	21	4	0	41	0	11	34	10	0	0	0	0	0	0	0	3	3	0	1	0
08:45 AM	4	24	34	0	0	25	7	0	32	0	15	40	6	0	0	0	0	0	0	0	6	1	0	1	0
08:50 AM	1	30	56	0	0	19	5	1	39	0	5	44	3	0	0	0	0	0	0	0	1	4	0	0	0
08:55 AM	1	19	53	0	0	20	5	0	36	0	8	44	13	0	0	0	0	0	0	0	4	6	0	1	0
Total	**60**	**607**	**1181**	**0**	**0**	**461**	**106**	**3**	**1060**	**0**	**246**	**1028**	**133**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**49**	**64**	**0**	**11**	**0**

Peak Hour: 7:40 AM - 8:40 AM
Peak 15: 7:45 AM - 8:00 AM
PHF: 0.906836

	Right	Right to I-8	Thru	Left	Peds	Right	Thru	Left to I-80	Left	Peds	Right	Thru	Left	Left to I-80	Peds	Right to Si	Right to I-8	Left to Sier	Left to I-80	Peds	Right to I-8	Right	Thru	Left	Peds
Total Volume	38	327	648	0	0	226	64	1	582	0	130	556	68	0	0	0	0	0	0	0	21	40	0	5	0
Total Trucks	0	24	34	0	0	16	1	0	15	0	17	31	3	0	0	0	0	0	0	0	0	3	0	0	0
Truck %	0%	7%	5%			7%	2%	0%	3%		13%	6%	4%								0%	8%		0%	

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

Location: Sierra College Blvd -- I-80 WB Ramps
Start Date: 11/17/2016
Site Code: 13963308

	Sierra College Blvd Southbound					I-80 WB Ramps Westbound					Sierra College Blvd Northbound					I-80 On-Ramp Northeastbound					I-80 WB Ramps Eastbound				
Start Time	Right	Right to I-80 On-Ramp	Thru	Left	Peds	Right	Thru	Left to I-80 On-Ramp	Left	Peds	Right	Thru	Left	Left to I-80 On-Ramp	Peds	Right to Sierra College Blvd	Right to I-80 WB Ramps	Left to Sierra College Blvd	Left to I-80 WB Ramps	Peds	Right to I-80 On-Ramp	Right	Thru	Left	Peds
04:00 PM	4	19	76	0	0	18	5	1	32	0	18	46	7	0	0	0	0	0	0	0	9	20	0	6	0
04:05 PM	6	19	61	0	0	11	2	0	17	0	15	64	13	0	0	0	0	0	0	0	7	10	0	1	0
04:10 PM	6	32	73	0	0	16	9	0	33	0	18	73	11	0	0	0	0	0	0	0	4	9	0	5	0
04:15 PM	10	14	83	0	0	19	4	0	25	0	17	77	15	0	0	0	0	0	0	0	6	11	0	6	0
04:20 PM	4	24	55	0	0	24	10	0	35	0	21	81	17	0	0	0	0	0	0	0	5	16	0	7	0
04:25 PM	11	18	53	0	0	15	9	0	35	0	17	63	15	0	0	0	0	0	0	0	6	16	0	4	0
04:30 PM	4	18	53	0	0	14	5	0	32	0	16	64	19	0	0	0	0	0	0	0	6	13	0	7	0
04:35 PM	7	20	46	0	0	9	10	0	29	0	19	67	16	0	0	0	0	0	0	0	9	15	0	8	0
04:40 PM	4	34	66	0	0	12	5	0	30	0	28	79	17	0	0	0	0	0	0	0	5	10	0	6	1
04:45 PM	5	27	62	0	0	15	7	0	39	0	10	52	11	0	0	0	0	0	0	0	5	19	0	9	0
04:50 PM	7	28	66	0	0	8	7	0	20	0	13	81	28	0	0	0	0	0	0	0	9	7	0	3	0
04:55 PM	4	30	64	0	0	12	10	0	32	0	24	75	22	0	0	0	0	0	0	0	5	16	0	6	0
05:00 PM	7	32	45	0	0	19	5	0	36	0	20	71	21	0	0	0	0	0	0	0	7	18	0	5	0
05:05 PM	9	40	63	0	0	24	13	0	28	0	31	62	19	0	0	0	0	0	0	0	16	7	0	6	1
05:10 PM	11	14	96	0	0	19	5	0	34	0	17	83	18	0	0	0	0	0	0	0	5	9	0	4	0
05:15 PM	5	2	85	0	0	14	10	0	38	0	25	67	21	0	0	0	0	0	0	0	8	14	0	7	1
05:20 PM	7	13	50	0	0	23	17	0	52	0	23	74	25	0	0	0	0	0	0	0	9	8	0	6	0
05:25 PM	11	8	98	0	0	15	3	0	38	0	15	67	24	0	0	0	0	0	0	0	5	5	0	11	1
05:30 PM	15	11	70	0	0	18	16	1	32	0	17	63	19	0	0	0	0	0	0	0	1	11	0	2	0
05:35 PM	9	19	53	0	0	17	6	0	40	0	17	62	24	0	0	0	0	0	0	0	6	3	0	12	0
05:40 PM	4	15	55	0	0	17	10	0	38	0	19	54	22	0	0	0	0	0	0	0	11	13	0	9	1
05:45 PM	8	11	42	0	0	23	12	0	25	0	16	58	28	0	0	0	0	0	0	0	4	8	0	6	0
05:50 PM	13	9	54	0	0	14	11	0	44	0	12	54	19	0	0	0	0	0	0	0	4	14	0	8	0
05:55 PM	9	14	51	0	0	15	6	0	30	0	16	54	28	0	0	0	0	0	0	0	2	12	0	9	0
Total	**180**	**471**	**1520**	**0**	**0**	**391**	**197**	**2**	**794**	**0**	**444**	**1591**	**459**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**154**	**284**	**0**	**153**	**5**

Peak Hour: 4:40 PM - 5:40 PM
Peak 15: 5:05 PM - 5:20 PM
PHF: 0.940924

	Right	Right to I-8	Thru	Left	Peds	Right	Thru	Left to I-80	Left	Peds	Right	Thru	Left	Left to I-80	Peds	Right to Si	Right to I-8	Left to Sier	Left to I-80	Peds	Right to I-8	Right	Thru	Left	Peds
Total Volume	94	258	818	0	0	196	104	1	419	0	240	836	249	0	0	0	0	0	0	0	81	127	0	77	4
Total Truck	1	8	21	0	0	10	2	0	11	0	4	21	2	0	0	0	0	0	0	0	0	2	0	0	0
Truck %	1%	3%	3%			5%	2%	0%	3%		2%	3%	1%								0%	2%		0%	0%

Location: Sierra College Blvd -- I-80 EB Ramps
Start Date: 11/17/2016
Site Code: 13963309

	Sierra College Blvd Southbound					I-80 On-Ramp Southwestbound					I-80 EB Ramps Westbound					Sierra College Blvd Northbound					I-80 EB Ramps Eastbound				
Start Time	Right	Thru	Left	Hard Left to I-80 On-Ramp	Peds	Hard Right to Sierra College Blvd	Bear Right to I-80 EB Ramps	Bear Left to Sierra College Blvd	Hard Left to I-80 EB Ramps	Peds	Hard Right to I-80 On-Ramp	Right	Thru	Left	Peds	Right	Bear Right to I-80 On-Ramp	Thru	Left	Peds	Right	Thru	Bear Left to I-80 On-Ramp	Left	Peds
07:00 AM	4	41	10	0	0	0	0	0	0	0	5	8	0	4	0	0	12	27	0	0	8	4	0	13	0
07:05 AM	9	56	5	0	0	0	0	0	0	0	1	6	0	5	0	2	18	23	0	0	6	9	0	11	0
07:10 AM	10	48	13	0	0	0	0	0	0	0	5	5	0	5	0	2	26	28	0	0	4	14	0	17	0
07:15 AM	4	63	14	0	0	0	0	0	0	0	6	10	0	2	0	1	25	21	0	0	3	9	1	25	0
07:20 AM	12	66	13	0	0	0	0	0	0	0	7	10	0	3	0	0	23	34	0	0	3	15	0	18	0
07:25 AM	6	70	4	0	0	0	0	0	0	0	5	4	0	6	0	0	33	22	0	0	1	5	1	23	0
07:30 AM	8	77	15	0	0	0	0	0	0	0	9	10	0	2	0	1	44	26	0	0	8	13	0	16	0
07:35 AM	9	77	18	0	0	0	0	0	0	0	6	7	0	2	0	2	28	20	0	0	13	7	0	28	0
07:40 AM	9	87	9	0	0	0	0	0	0	0	6	9	0	5	1	2	24	32	0	0	25	6	0	33	0
07:45 AM	7	77	9	0	0	0	0	0	0	0	7	9	0	4	0	1	30	35	0	0	19	7	0	24	0
07:50 AM	16	135	7	0	0	0	0	0	0	0	5	6	0	4	0	0	37	41	0	0	36	6	1	21	0
07:55 AM	15	91	13	0	0	0	0	0	0	0	7	10	0	1	0	4	28	33	0	0	12	7	0	19	0
08:00 AM	22	74	11	0	0	0	0	0	0	0	2	7	0	3	0	5	22	27	0	0	11	7	0	35	0
08:05 AM	15	75	8	0	0	0	0	0	0	0	5	9	0	3	0	0	28	31	0	0	13	11	0	21	0
08:10 AM	7	62	12	0	0	0	0	0	0	0	8	8	0	5	0	0	19	23	0	0	7	11	0	25	0
08:15 AM	15	98	29	0	0	0	0	0	0	0	4	5	0	3	0	0	28	38	0	0	4	4	0	22	0
08:20 AM	15	47	18	0	0	0	0	0	0	0	7	9	0	0	0	0	21	23	0	0	14	11	0	24	0
08:25 AM	14	76	17	0	0	0	0	0	0	0	7	6	0	4	0	2	20	14	0	0	11	8	0	23	0
08:30 AM	25	70	21	0	0	0	0	0	0	0	7	7	0	4	0	2	30	25	0	0	12	9	0	24	0
08:35 AM	21	52	18	0	1	0	0	0	0	0	5	10	0	2	0	1	15	16	0	0	12	12	0	29	0
08:40 AM	24	49	18	0	0	0	0	0	0	0	2	9	0	5	0	2	17	23	0	0	11	5	0	24	0
08:45 AM	7	45	14	0	0	0	0	0	0	0	5	11	0	1	0	4	15	32	0	0	4	20	0	17	0
08:50 AM	5	57	17	0	0	0	0	0	0	0	9	4	0	4	0	4	22	35	0	0	7	7	0	21	0
08:55 AM	18	69	18	0	0	0	0	0	0	0	4	7	0	3	0	6	12	24	0	0	6	9	0	34	0
Total	**297**	**1662**	**331**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**134**	**186**	**0**	**80**	**1**	**41**	**577**	**653**	**0**	**0**	**250**	**216**	**3**	**547**	**0**

Peak Hour: 7:35 AM - 8:35 AM
Peak 15: 7:40 AM - 7:55 AM
PHF: 0.870581

	Right	Thru	Left	Hard Left t	Peds	Hard Right	Bear Right	Bear Left t	Hard Left t	Peds	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left t	Left	Peds
Total Volume	169	969	172	0	0	0	0	0	0	0	71	92	0	38	1	18	315	342	0	0	177	94	1	299	0
Total Truck	16	22	4	0	0	0	0	0	0	0	5	2	0	1	0	1	23	23	0	0	13	3	0	21	0
Truck %	9%	2%	2%								7%	2%		3%	0%	6%	7%	7%			7%	3%	0%	7%	

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

Location: Sierra College Blvd -- I-80 EB Ramps
Start Date: 11/17/2016
Site Code: 13963310

	Sierra College Blvd Southbound					I-80 On-Ramp Southwestbound					I-80 EB Ramps Westbound					Sierra College Blvd Northbound					I-80 EB Ramps Eastbound				
Start Time	Right	Thru	Left	Hard Left to I-80 On-Ramp	Peds	Hard Right to Sierra College Blvd	Bear Right to I-80 EB Ramps	Bear Left to Sierra College Blvd	Hard Left to I-80 EB Ramps	Peds	Hard Right to I-80 On-Ramp	Right	Thru	Left	Peds	Right	Bear Right to I-80 On-Ramp	Thru	Left	Peds	Right	Thru	Bear Left to I-80 On-Ramp	Left	Peds
04:00 PM	29	52	20	0	0	0	0	0	0	0	25	23	0	7	0	8	23	42	0	0	6	20	0	25	0
04:05 PM	28	58	23	0	0	0	0	0	0	0	19	16	0	7	0	6	45	54	0	0	8	14	0	21	0
04:10 PM	23	56	20	0	0	0	0	0	0	0	23	26	0	12	0	3	53	56	0	0	4	15	0	40	0
04:15 PM	22	63	32	0	0	0	0	0	0	0	16	22	0	3	0	6	47	57	0	0	2	16	0	35	0
04:20 PM	31	43	16	0	0	0	0	0	0	0	15	28	0	6	0	3	26	51	0	0	4	10	1	37	0
04:25 PM	27	76	22	0	0	0	0	0	0	0	30	22	0	6	0	3	50	53	0	0	7	11	0	16	0
04:30 PM	28	44	27	0	0	0	0	0	0	0	23	24	0	6	0	8	44	50	0	0	3	19	0	28	0
04:35 PM	19	58	23	0	0	0	0	0	0	0	19	25	0	10	0	8	26	52	0	0	1	25	0	37	0
04:40 PM	30	49	17	0	0	0	0	0	0	0	25	23	0	12	0	15	37	52	0	0	3	6	0	39	0
04:45 PM	27	74	25	0	0	0	0	0	0	0	23	22	0	7	0	6	37	51	0	0	3	17	1	25	0
04:50 PM	22	35	25	0	0	0	0	0	0	0	18	18	0	12	0	2	49	62	0	0	4	22	0	29	0
04:55 PM	27	69	15	0	0	0	0	0	0	0	13	25	0	4	0	17	42	65	0	0	8	22	0	23	0
05:00 PM	35	55	25	0	0	0	0	0	0	0	25	20	0	7	0	3	58	72	0	0	4	14	0	30	0
05:05 PM	21	58	13	0	0	0	0	0	0	0	17	28	0	14	0	9	40	60	0	0	7	20	0	30	0
05:10 PM	29	73	18	0	0	0	0	0	0	0	22	28	0	8	0	3	46	54	0	0	7	26	0	31	0
05:15 PM	27	72	36	0	0	0	0	0	0	0	22	22	0	3	0	7	46	80	0	0	6	14	0	20	0
05:20 PM	25	64	18	0	0	0	0	0	0	0	18	26	0	10	0	4	38	47	0	0	3	19	0	42	0
05:25 PM	25	75	26	0	0	0	0	0	0	0	14	18	0	3	0	6	40	60	0	0	2	10	0	28	0
05:30 PM	21	69	22	0	0	0	0	0	0	0	20	24	0	8	0	8	26	35	0	0	7	25	0	34	0
05:35 PM	32	73	24	0	0	0	0	0	0	0	11	26	0	9	0	3	39	56	0	0	5	13	0	21	0
05:40 PM	28	51	26	0	0	0	0	0	0	0	12	23	0	7	0	6	45	53	0	0	2	18	0	31	0
05:45 PM	18	53	32	0	0	0	0	0	0	0	22	13	0	6	0	1	39	39	0	0	4	17	0	31	0
05:50 PM	21	47	19	0	0	0	0	0	0	0	26	15	0	11	0	2	27	53	0	0	5	12	0	46	0
05:55 PM	26	49	32	0	0	0	0	0	0	0	18	22	0	4	0	2	40	43	0	0	5	14	0	29	0
Total	**621**	**1416**	**556**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**476**	**539**	**0**	**182**	**0**	**139**	**963**	**1297**	**0**	**0**	**110**	**399**	**2**	**728**	**0**

Peak Hour: 4:20 PM - 5:20 PM
Peak 15: 5:10 PM - 5:25 PM
PHF: 0.949607

	Right	Thru	Left	Hard Left t	Peds	Hard Right	Bear Right	Bear Left t	Hard Left t	Peds	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left t	Left	Peds
Total Volume	348	770	280	0	0	0	0	0	0	0	270	311	0	105	0	88	539	749	0	0	60	225	2	387	0
Total Trucks	5	24	2	0	0	0	0	0	0	0	0	4	0	1	0	0	8	20	0	0	1	1	0	8	0
Truck %	1%	3%	1%								0%	1%		1%		0%	1%	3%			2%	0%	0%	2%	

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

Location: Sierra College Blvd -- I-80 EB Ramps
Date: 1/28/2017
Site Code: 14088505

	Sierra College Blvd Southbound					On Ramp Southwestbound					I-80 EB Ramps Westbound					Sierra College Blvd Northbound					I-80 EB Ramps Eastbound				
Start Time	Right	Thru	Left	Hard Left	U-Turns	Hard Right	Bear Right	Bear Left	Hard Left	U-Turns	Hard Right	Right	Thru	Left	U-Turns	Right	Bear Right	Thru	Left	U-Turns	Right	Thru	Bear Left	Left	U-Turns
11:00 AM	13	28	13	0	0	0	0	0	0	0	12	15	0	8	0	4	13	45	0	0	2	29	0	29	0
11:05 AM	17	25	23	0	0	0	0	0	0	0	12	23	0	7	0	10	12	31	0	1	6	15	0	21	0
11:10 AM	11	46	28	0	0	0	0	0	0	0	16	12	0	4	1	10	24	39	0	1	7	19	0	24	0
11:15 AM	17	42	33	0	0	0	0	0	0	0	8	24	0	6	0	7	17	23	0	0	4	17	0	12	0
11:20 AM	18	36	31	0	0	0	0	0	0	0	16	17	0	7	0	7	23	29	0	3	3	31	0	39	0
11:25 AM	22	50	31	0	0	0	0	0	0	0	21	14	0	6	0	7	17	20	0	0	6	29	0	25	0
11:30 AM	17	39	28	0	0	0	0	0	0	0	12	25	0	10	1	14	16	20	0	1	6	14	0	20	0
11:35 AM	10	34	33	0	0	0	0	0	0	0	13	26	0	4	0	5	20	31	0	0	8	23	0	10	0
11:40 AM	19	41	37	0	0	0	0	0	0	0	27	30	0	9	0	6	21	28	0	2	3	21	0	25	0
11:45 AM	22	29	30	0	0	0	0	0	0	0	20	17	0	7	0	9	31	44	0	1	2	37	0	32	0
11:50 AM	27	38	38	0	0	0	0	0	0	0	18	25	0	10	0	2	23	56	0	3	3	13	0	21	0
11:55 AM	13	35	44	0	0	0	0	0	0	0	23	26	0	11	0	6	19	34	0	1	7	22	0	38	0
12:00 PM	22	47	16	0	0	0	0	0	0	0	20	29	0	11	1	8	13	26	0	2	3	37	0	24	0
12:05 PM	20	37	21	0	0	0	0	0	0	0	17	23	0	4	0	12	24	43	0	0	2	22	0	22	0
12:10 PM	8	36	56	0	0	0	0	0	0	0	15	34	0	10	0	9	17	22	0	1	6	12	0	28	0
12:15 PM	25	50	45	0	0	0	0	0	0	0	26	27	0	8	0	8	9	31	0	0	7	18	0	37	0
12:20 PM	14	46	28	0	0	0	0	0	0	0	13	31	0	9	0	6	32	45	0	0	3	26	0	40	0
12:25 PM	17	38	49	0	0	0	0	0	0	0	19	31	0	7	0	5	19	22	0	1	3	20	0	34	0
12:30 PM	12	55	43	0	0	0	0	0	0	0	12	33	0	14	0	9	21	32	0	0	5	23	0	32	0
12:35 PM	20	42	25	0	0	0	0	0	0	0	18	29	0	5	1	10	19	36	0	5	6	30	0	40	0
12:40 PM	11	33	32	0	0	0	0	0	0	0	17	31	0	8	0	10	33	37	0	1	8	23	0	21	0
12:45 PM	20	32	30	0	0	0	0	0	0	0	22	28	0	6	0	6	15	36	0	0	9	22	0	36	0
12:50 PM	18	41	49	0	0	0	0	0	0	0	20	31	0	10	1	9	14	23	0	1	5	27	0	25	0
12:55 PM	16	41	30	0	0	0	0	0	0	0	24	21	0	12	0	10	18	49	0	0	7	21	0	44	0
Totals	**409**	**941**	**793**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**421**	**602**	**0**	**193**	**5**	**189**	**470**	**802**	**0**	**24**	**121**	**551**	**0**	**679**	**0**

Peak Hour: 11:45 AM - 12:45 PM
Peak 15-Min: 12:20 PM - 12:35 PM
PHF: 0.969

	Right	Thru	Left	Hard Left	U-Turns	Hard Right	Bear Right	Bear Left	Hard Left	U-Turns	Hard Right	Right	Thru	Left	U-Turns	Right	Bear Right	Thru	Left	U-Turns	Right	Thru	Bear Left	Left	U-Turns
Total Volume	219	494	432	0	0	0	0	0	0	0	228	335	0	105	2	90	248	419	0	16	50	281	0	373	0
Total Trucks	8	15	3	0	0	0	0	0	0	0	5	1	0	0	0	0	8	16	0	0	2	5	0	8	0
Truck %	4%	3%	1%								2%	0%		0%	0%	0%	3%	4%		0%	4%	2%		2%	

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

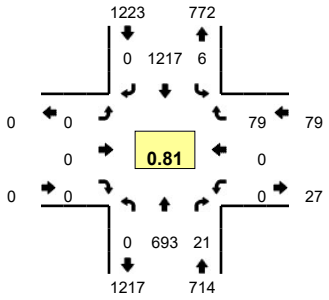
LOCATION: Sierra College Blvd -- Schriber Way

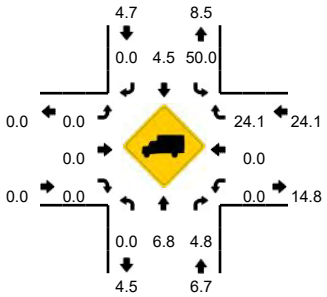
CITY/STATE: Placer, CA

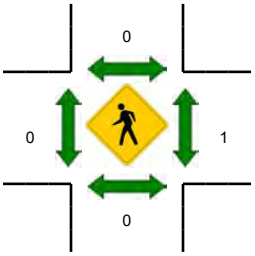
QC JOB #: 13963317

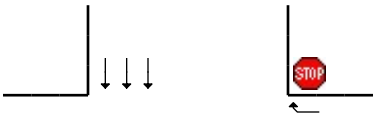
DATE: Thu, Nov 17 2016

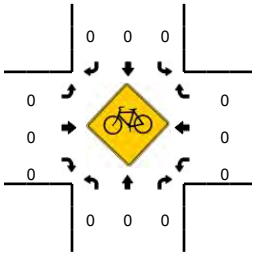
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

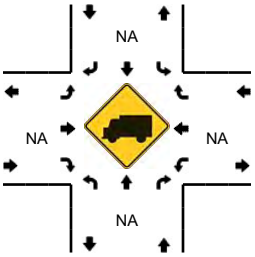


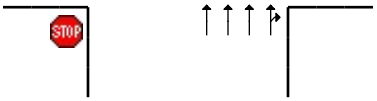


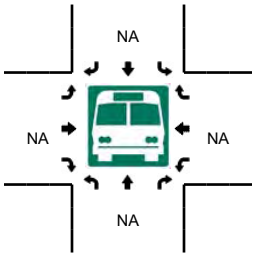












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Schriber Way (Eastbound)				Schriber Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	34	2	0	1	61	0	0	0	0	0	0	0	0	4	0	102	
7:05 AM	0	40	0	0	1	63	0	0	0	0	0	0	0	0	5	0	109	
7:10 AM	0	53	1	0	0	58	0	0	0	0	0	0	0	0	2	0	114	
7:15 AM	0	51	0	0	0	70	0	0	0	0	0	0	0	0	4	0	125	
7:20 AM	0	63	2	0	0	79	0	0	0	0	0	0	0	0	4	0	148	
7:25 AM	0	41	1	0	1	92	0	0	0	0	0	0	0	0	7	0	142	
7:30 AM	0	68	4	0	1	92	0	0	0	0	0	0	0	0	4	0	169	
7:35 AM	0	54	2	0	1	97	0	0	0	0	0	0	0	0	4	0	158	
7:40 AM	0	51	1	0	3	121	0	0	0	0	0	0	0	0	6	0	182	
7:45 AM	0	76	5	0	0	109	0	0	0	0	0	0	0	0	8	0	198	
7:50 AM	0	62	0	0	0	172	0	0	0	0	0	0	0	0	10	0	244	
7:55 AM	0	55	0	0	0	109	0	0	0	0	0	0	0	0	9	0	173	1864
8:00 AM	0	46	1	0	0	95	0	0	0	0	0	0	0	0	8	0	150	1912
8:05 AM	0	62	1	0	0	81	0	0	0	0	0	0	0	0	6	0	150	1953
8:10 AM	0	44	2	0	0	77	0	0	0	0	0	0	0	0	8	0	131	1970
8:15 AM	0	71	2	0	0	93	0	0	0	0	0	0	0	0	5	0	171	2016
8:20 AM	0	32	2	0	0	63	0	0	0	0	0	0	0	0	5	0	102	1970
8:25 AM	0	36	1	0	2	89	0	0	0	0	0	0	0	0	4	0	132	1960
8:30 AM	0	56	3	0	0	83	0	0	0	0	0	0	0	0	6	0	148	1939
8:35 AM	0	42	1	0	1	69	0	0	0	0	0	0	0	0	1	0	114	1895
8:40 AM	0	43	2	0	0	70	0	0	0	0	0	0	0	0	3	0	118	1831
8:45 AM	0	42	0	0	0	58	0	0	0	0	0	0	0	0	7	0	107	1740
8:50 AM	0	59	0	0	0	73	0	0	0	0	0	0	0	0	4	0	136	1632
8:55 AM	0	45	2	0	0	80	0	0	0	0	0	0	0	0	2	0	129	1588

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	756	24	0	12	1608	0	0	0	0	0	0	0	0	96	0	2496
Heavy Trucks	0	60	4		8	44	0		0	0	0		0	0	32		148
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

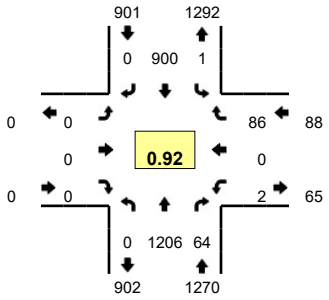
Type of peak hour being reported: Intersection Peak

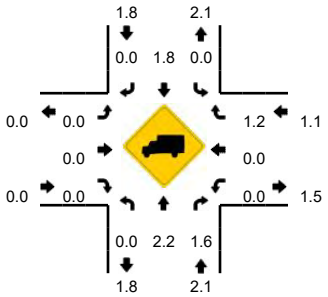
Method for determining peak hour: Total Entering Volume

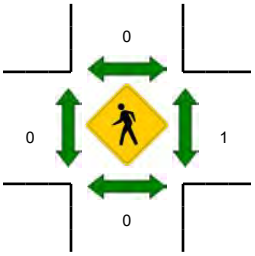
LOCATION: Sierra College Blvd -- Schriber Way
CITY/STATE: Placer, CA

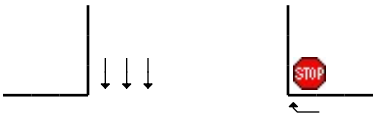
QC JOB #: 13963318
DATE: Thu, Nov 17 2016

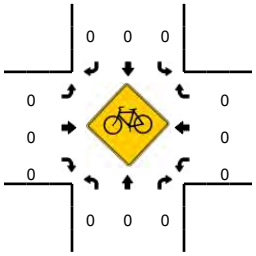
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

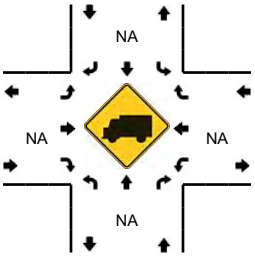


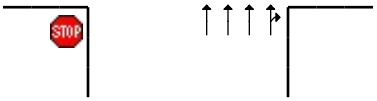


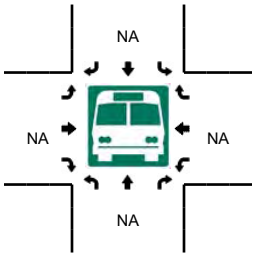












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Schriber Way (Eastbound)				Schriber Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	74	6	0	0	67	0	0	0	0	0	0	0	0	5	0	152	
4:05 PM	0	88	2	0	0	74	0	0	0	0	0	0	0	0	4	0	168	
4:10 PM	0	101	3	0	0	69	0	0	0	0	0	0	0	0	9	0	182	
4:15 PM	0	104	2	0	0	77	0	0	0	0	0	0	0	0	6	0	189	
4:20 PM	0	88	5	0	1	65	0	0	0	0	0	0	1	0	4	0	164	
4:25 PM	0	88	6	0	0	86	0	0	0	0	0	0	0	0	10	0	190	
4:30 PM	0	87	5	0	0	55	0	0	0	0	0	0	0	0	8	0	155	
4:35 PM	0	84	5	0	0	70	0	0	0	0	0	0	1	0	11	0	171	
4:40 PM	0	97	7	0	0	61	0	0	0	0	0	0	0	0	10	0	175	
4:45 PM	0	93	5	0	0	86	0	0	0	0	0	0	0	0	7	0	191	
4:50 PM	0	104	8	0	0	54	0	0	0	0	0	0	0	0	8	0	174	
4:55 PM	0	108	7	0	1	83	0	0	0	0	0	0	1	0	11	0	211	2122
5:00 PM	0	139	4	0	0	68	0	0	0	0	0	0	0	0	6	0	217	2187
5:05 PM	0	91	11	0	0	77	0	0	0	0	0	0	1	0	8	0	188	2207
5:10 PM	0	110	1	0	0	82	0	0	0	0	0	0	0	0	6	0	199	2224
5:15 PM	0	113	2	0	0	83	0	0	0	0	0	0	0	0	7	0	205	2240
5:20 PM	0	90	4	0	0	67	0	0	0	0	0	0	0	0	7	0	168	2244
5:25 PM	0	95	5	0	0	81	0	0	0	0	0	0	0	0	5	0	186	2240
5:30 PM	0	81	3	0	0	82	0	0	0	0	0	0	0	0	1	0	167	2252
5:35 PM	0	85	7	0	0	76	0	0	0	0	0	0	0	0	10	0	178	2259
5:40 PM	0	96	5	0	0	65	0	0	0	0	0	0	0	0	2	0	168	2252
5:45 PM	0	77	5	0	0	63	0	0	0	0	0	0	0	0	5	0	150	2211
5:50 PM	0	77	5	0	0	65	0	0	0	0	0	0	0	0	9	0	156	2193
5:55 PM	0	78	3	0	0	57	0	0	0	0	0	0	1	0	6	0	145	2127

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1352	88	0	4	912	0	0	0	0	0	0	8	0	100	0	2464
Heavy Trucks	0	16	0		0	16	0		0	0	0		0	0	0		32
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

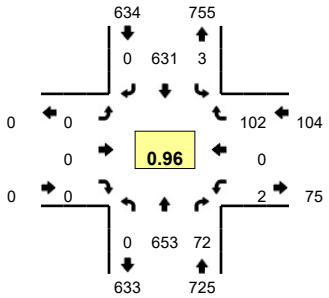
LOCATION: A2 - Sierra†College†Blvd -- Schriber†Wy

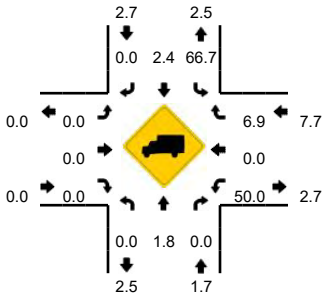
CITY/STATE: Placer, CA

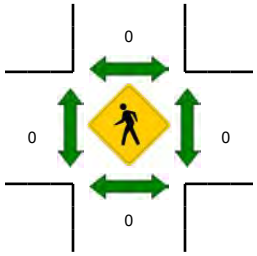
QC JOB #: 14088509

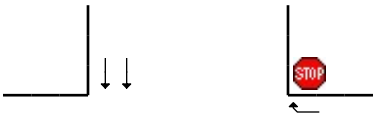
DATE: Sat, Jan 28 2017

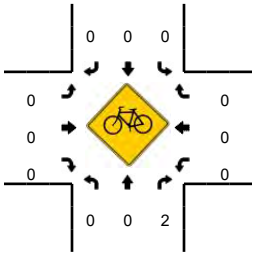
Peak-Hour: 11:50 AM -- 12:50 PM
Peak 15-Min: 12:30 PM -- 12:45 PM

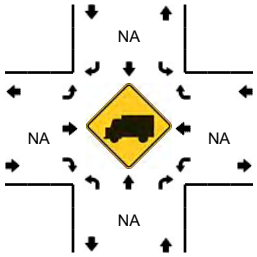


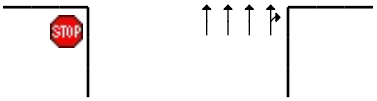


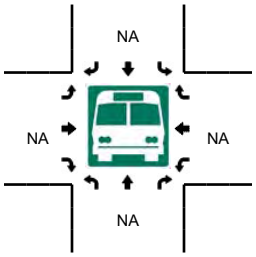












5-Min Count Period Beginning At	A2 - Sierra†College†Blvd (Northbound)				A2 - Sierra†College†Blvd (Southbound)				Schriber†Wy (Eastbound)				Schriber†Wy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	57	3	0	0	36	0	0	0	0	0	0	0	0	6	0	102	
11:05 AM	0	56	4	0	0	42	0	0	0	0	0	0	0	0	7	0	109	
11:10 AM	0	58	6	0	0	58	0	0	0	0	0	0	0	0	6	0	128	
11:15 AM	0	48	7	0	0	37	0	0	0	0	0	0	0	0	7	0	99	
11:20 AM	0	49	6	0	0	53	0	0	0	0	0	0	0	0	2	0	110	
11:25 AM	0	35	5	0	1	58	0	0	0	0	0	0	0	0	7	0	106	
11:30 AM	0	55	7	0	0	52	0	0	0	0	0	0	0	0	6	0	120	
11:35 AM	0	58	2	0	4	42	0	0	0	0	0	0	0	0	4	0	110	
11:40 AM	0	41	5	0	0	50	0	0	0	0	0	0	1	0	6	0	103	
11:45 AM	0	67	2	0	0	45	0	0	0	0	0	0	0	0	7	0	121	
11:50 AM	0	74	6	0	0	41	0	0	0	0	0	0	0	0	9	0	130	
11:55 AM	0	51	4	0	0	61	0	0	0	0	0	0	0	0	9	0	125	1363
12:00 PM	0	49	2	0	0	56	0	0	0	0	0	0	0	0	5	0	112	1373
12:05 PM	0	68	11	0	0	41	0	0	0	0	0	0	0	0	3	0	123	1387
12:10 PM	0	49	4	0	0	43	0	0	0	0	0	0	0	0	6	0	102	1361
12:15 PM	0	49	7	0	1	54	0	0	0	0	0	0	0	0	9	0	120	1382
12:20 PM	0	55	6	0	0	70	0	0	0	0	0	0	0	0	9	0	140	1412
12:25 PM	0	36	5	0	0	58	0	0	0	0	0	0	0	0	10	0	109	1415
12:30 PM	0	60	5	0	0	48	0	0	0	0	0	0	0	0	14	0	127	1422
12:35 PM	0	54	6	0	0	63	0	0	0	0	0	0	0	0	12	0	135	1447
12:40 PM	0	58	5	0	2	41	0	0	0	0	0	0	1	0	11	0	118	1462
12:45 PM	0	50	11	0	0	55	0	0	0	0	0	0	1	0	5	0	122	1463
12:50 PM	0	52	4	0	0	50	0	0	0	0	0	0	1	0	3	0	110	1443
12:55 PM	0	60	4	0	1	60	0	0	0	0	0	0	0	0	8	0	133	1451

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	688	64	0	8	608	0	0	0	0	0	0	4	0	148	0	1520
Heavy Trucks	0	4	0		8	16	0		0	0	0		0	0	24		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

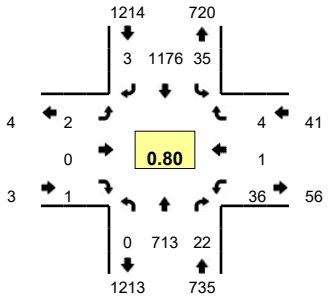
Type of peak hour being reported: Intersection Peak

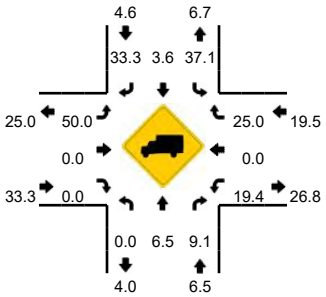
Method for determining peak hour: Total Entering Volume

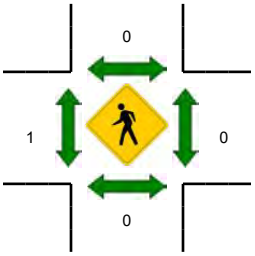
LOCATION: Sierra College Blvd -- Bass Pro Dr/Dominguez Rd
CITY/STATE: Placer, CA

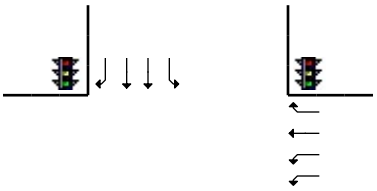
QC JOB #: 13963319
DATE: Thu, Nov 17 2016

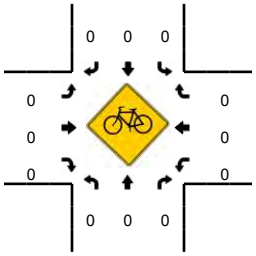
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

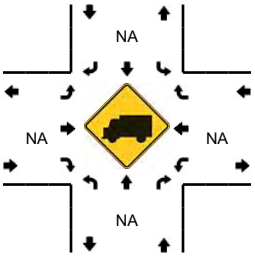


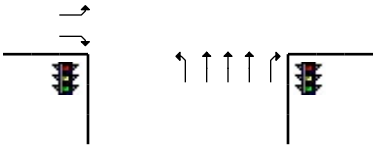


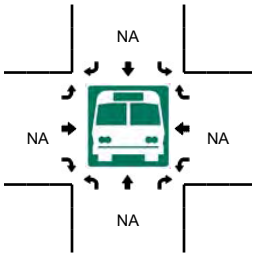












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Bass Pro Dr/Dominguez Rd (Eastbound)				Bass Pro Dr/Dominguez Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	36	6	0	6	60	0	0	0	0	0	0	0	0	0	0	108	
7:05 AM	0	37	3	0	3	52	0	0	2	0	2	0	2	0	2	0	103	
7:10 AM	0	55	3	0	1	56	1	0	2	0	2	0	3	0	2	0	125	
7:15 AM	0	54	3	0	5	68	0	0	0	0	0	0	0	0	0	0	130	
7:20 AM	0	64	2	0	4	79	0	0	0	0	0	0	3	0	0	0	152	
7:25 AM	0	42	1	0	2	80	0	0	0	0	0	0	4	0	1	0	130	
7:30 AM	0	70	1	0	1	87	0	0	0	0	0	0	2	0	0	0	161	
7:35 AM	0	55	3	0	1	101	0	1	0	0	0	0	3	0	1	0	165	
7:40 AM	0	53	3	0	3	128	0	0	0	0	0	0	2	0	0	0	189	
7:45 AM	0	82	3	0	1	101	1	0	1	0	0	0	5	1	1	0	196	
7:50 AM	0	61	3	0	3	166	0	0	1	0	0	0	2	0	0	0	236	
7:55 AM	0	57	3	0	2	118	0	0	0	0	0	0	4	0	0	0	184	1879
8:00 AM	0	45	1	0	5	92	0	0	0	0	0	0	3	0	1	0	147	1918
8:05 AM	0	64	1	0	4	68	0	0	0	0	0	0	3	0	0	0	140	1955
8:10 AM	0	45	1	0	4	72	1	0	0	0	0	0	3	0	0	0	126	1956
8:15 AM	0	75	0	0	4	84	1	0	0	0	1	0	2	0	0	0	167	1993
8:20 AM	2	35	6	0	4	64	0	0	1	0	1	0	3	0	0	0	116	1957
8:25 AM	0	36	3	0	3	77	0	0	0	0	0	0	2	0	1	0	122	1949
8:30 AM	0	59	0	0	2	76	0	0	0	0	0	0	0	0	1	0	138	1926
8:35 AM	0	42	3	0	4	63	1	0	0	0	0	0	0	0	0	0	113	1874
8:40 AM	0	46	1	0	1	78	0	0	0	0	0	0	3	0	1	0	130	1815
8:45 AM	0	40	0	0	2	53	1	0	0	0	0	0	2	0	2	0	100	1719
8:50 AM	0	61	4	0	1	64	1	0	0	0	0	0	3	0	0	0	134	1617
8:55 AM	0	47	2	0	0	79	0	0	0	0	0	0	3	0	0	0	131	1564

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	784	36	0	28	1580	4	0	8	0	0	0	36	4	4	0	2484
Heavy Trucks	0	56	4		4	40	4		4	0	0		4	0	0		116
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

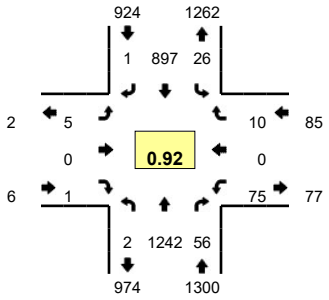
Type of peak hour being reported: Intersection Peak

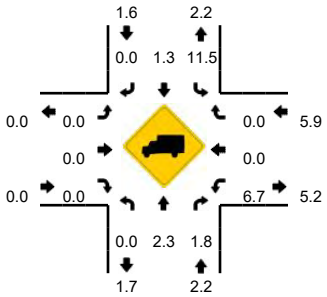
Method for determining peak hour: Total Entering Volume

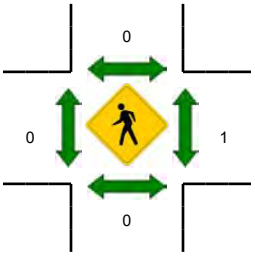
LOCATION: Sierra College Blvd -- Bass Pro Dr/Dominguez Rd
CITY/STATE: Placer, CA

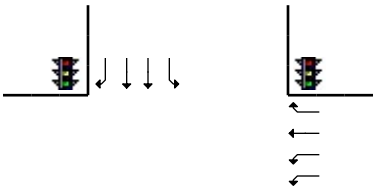
QC JOB #: 13963320
DATE: Thu, Nov 17 2016

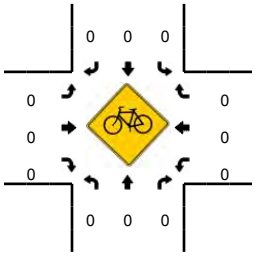
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

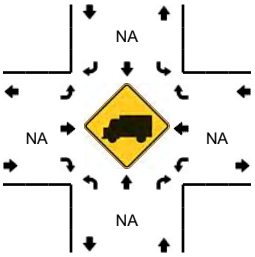


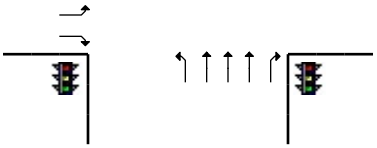


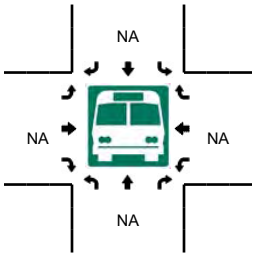












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Bass Pro Dr/Dominguez Rd (Eastbound)				Bass Pro Dr/Dominguez Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	81	4	0	4	74	0	0	0	0	0	0	3	0	0	0	167	
4:05 PM	0	93	1	0	0	74	0	0	0	0	0	0	3	0	0	0	171	
4:10 PM	0	100	6	0	1	70	0	0	1	0	0	0	1	0	2	0	181	
4:15 PM	0	104	6	0	0	75	0	0	0	0	0	0	5	0	1	0	191	
4:20 PM	0	89	4	0	1	60	0	0	0	0	0	0	2	0	1	0	157	
4:25 PM	0	93	6	0	3	80	0	0	0	0	0	0	2	0	0	0	184	
4:30 PM	0	85	4	0	5	48	0	4	0	0	0	0	2	0	3	0	151	
4:35 PM	0	86	6	0	2	61	0	0	0	0	0	0	5	0	0	0	160	
4:40 PM	0	100	5	0	0	73	1	0	0	0	0	0	4	0	2	0	185	
4:45 PM	0	94	4	0	3	69	0	1	2	0	1	0	4	0	0	0	178	
4:50 PM	0	107	1	0	0	64	0	1	2	0	0	0	6	0	0	0	181	
4:55 PM	0	113	4	0	2	76	0	1	0	0	0	0	12	0	1	0	209	2115
5:00 PM	0	141	8	0	1	76	0	1	0	0	0	0	7	0	1	0	235	2183
5:05 PM	0	100	3	0	2	73	0	0	0	0	0	0	8	0	1	0	187	2199
5:10 PM	0	112	4	0	2	87	0	0	0	0	0	0	3	0	1	0	209	2227
5:15 PM	0	112	8	0	2	81	0	0	0	0	0	0	5	0	2	0	210	2246
5:20 PM	1	93	5	0	1	72	0	0	1	0	0	0	4	0	0	0	177	2266
5:25 PM	0	100	6	0	4	71	0	1	0	0	0	0	7	0	1	0	190	2272
5:30 PM	0	81	6	1	0	83	0	0	0	0	0	0	8	0	1	0	180	2301
5:35 PM	0	89	2	0	4	72	0	0	0	0	0	0	7	0	0	0	174	2315
5:40 PM	0	101	5	0	0	66	2	0	0	0	0	0	5	0	0	0	179	2309
5:45 PM	0	80	6	0	4	58	0	0	0	0	0	0	4	0	0	0	152	2283
5:50 PM	1	77	3	0	2	70	0	0	0	0	0	0	6	0	2	0	161	2263
5:55 PM	0	82	4	0	0	56	0	0	0	0	0	0	10	0	0	0	152	2206

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1416	60	0	20	900	0	8	0	0	0	0	108	0	12	0	2524
Heavy Trucks	0	20	0		8	12	0		0	0	0		8	0	0		48
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

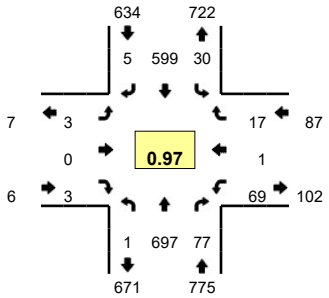
Type of peak hour being reported: Intersection Peak

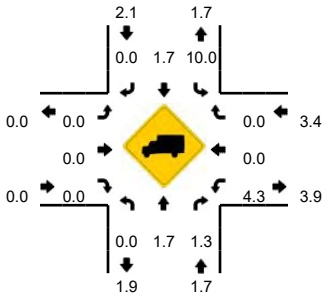
Method for determining peak hour: Total Entering Volume

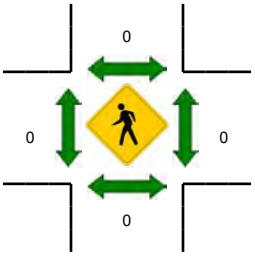
LOCATION: A3 - Sierra†College†Blvd -- Bass†Pro†Dr/Dominguez Rd
CITY/STATE: Placer, CA

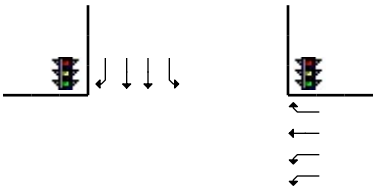
QC JOB #: 14088510
DATE: Sat, Jan 28 2017

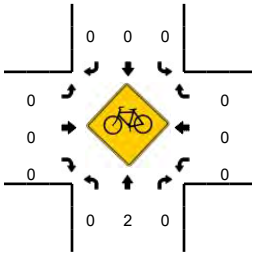
Peak-Hour: 11:50 AM -- 12:50 PM
Peak 15-Min: 12:35 PM -- 12:50 PM

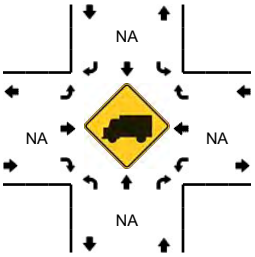


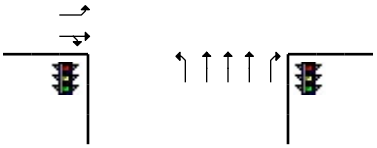


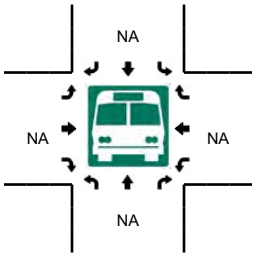












5-Min Count Period Beginning At	A3 - Sierra†College†Blvd (Northbound)				A3 - Sierra†College†Blvd (Southbound)				Bass†Pro†Dr/Dominguez Rd (Eastbound)				Bass†Pro†Dr/Dominguez Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	58	1	0	1	33	0	0	0	0	0	0	5	0	0	0	98	
11:05 AM	0	59	4	0	6	39	0	0	0	0	0	0	4	0	0	0	112	
11:10 AM	0	63	3	0	1	54	0	0	0	0	0	0	1	0	1	0	123	
11:15 AM	1	53	5	0	1	38	0	1	0	0	1	0	1	0	1	0	102	
11:20 AM	0	55	7	0	1	52	0	0	0	0	1	0	6	0	2	0	124	
11:25 AM	1	37	5	0	4	53	0	1	0	0	1	0	2	0	1	0	105	
11:30 AM	0	58	7	0	2	48	0	1	1	0	1	0	5	0	3	0	126	
11:35 AM	0	58	6	0	2	33	0	0	0	0	0	0	5	0	2	0	106	
11:40 AM	0	44	3	0	3	53	0	0	0	0	0	0	1	0	2	0	106	
11:45 AM	0	68	3	0	1	48	2	0	0	0	0	0	0	0	1	0	123	
11:50 AM	0	77	4	0	3	37	0	0	1	0	1	0	8	0	0	0	131	
11:55 AM	0	54	6	0	0	61	0	1	0	0	0	0	6	0	0	0	128	1384
12:00 PM	0	48	11	0	2	56	0	0	0	0	0	0	4	0	1	0	122	1408
12:05 PM	0	80	9	0	0	41	0	0	0	0	0	0	3	0	1	0	134	1430
12:10 PM	0	51	10	0	3	34	1	0	0	0	1	0	5	0	2	0	107	1414
12:15 PM	0	52	2	0	3	56	1	1	0	0	0	0	4	0	2	0	121	1433
12:20 PM	0	60	2	0	2	62	0	0	1	0	0	0	2	0	1	0	130	1439
12:25 PM	0	40	8	0	1	57	0	0	0	0	0	0	3	0	1	0	110	1444
12:30 PM	0	63	3	0	3	49	0	0	0	0	0	0	11	0	1	0	130	1448
12:35 PM	1	56	8	0	4	55	0	0	0	0	0	0	7	0	3	0	134	1476
12:40 PM	0	61	12	0	2	40	1	0	1	0	0	0	5	0	2	0	124	1494
12:45 PM	0	55	2	0	2	51	2	3	0	0	1	0	11	1	3	0	131	1502
12:50 PM	0	53	6	0	2	47	0	0	0	0	1	0	8	0	2	0	119	1490
12:55 PM	0	64	4	0	3	53	0	0	1	0	1	0	5	0	0	0	131	1493

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	688	88	0	32	584	12	12	4	0	4	0	92	4	32	0	1556
Heavy Trucks	0	8	0		0	20	0		0	0	0		4	0	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

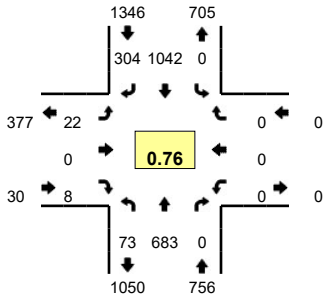
Type of peak hour being reported: Intersection Peak

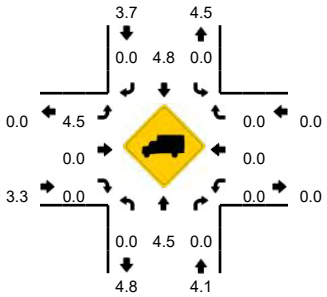
Method for determining peak hour: Total Entering Volume

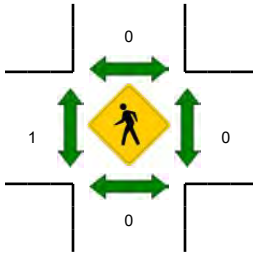
LOCATION: Sierra College Blvd -- Stadium Dwy
CITY/STATE: Placer, CA

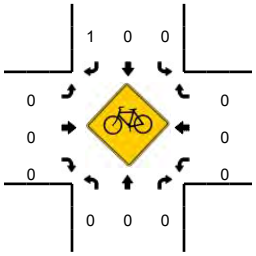
QC JOB #: 13963321
DATE: Wed, Nov 30 2016

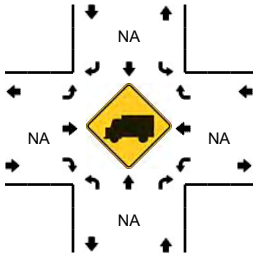
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

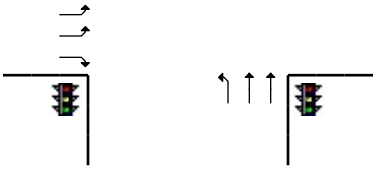


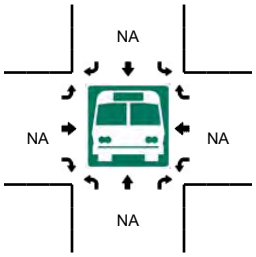












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Stadium Dwy (Eastbound)				Stadium Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	29	0	0	0	48	5	0	0	0	1	0	0	0	0	0	86	
7:05 AM	2	42	0	0	0	37	4	0	2	0	0	0	0	0	0	0	87	
7:10 AM	1	47	0	0	0	68	4	0	0	0	0	0	0	0	0	0	120	
7:15 AM	2	47	0	0	0	51	8	0	1	0	0	0	0	0	0	0	109	
7:20 AM	3	52	0	0	0	58	14	0	1	0	4	0	0	0	0	0	132	
7:25 AM	4	59	0	0	0	81	8	0	1	0	0	0	0	0	0	0	153	
7:30 AM	4	52	0	0	0	74	20	0	2	0	0	0	0	0	0	0	152	
7:35 AM	2	66	0	0	0	86	33	0	3	0	2	0	0	0	0	0	192	
7:40 AM	10	50	0	0	0	113	35	0	1	0	0	0	0	0	0	0	209	
7:45 AM	11	64	0	0	0	108	41	0	3	0	0	0	0	0	0	0	227	
7:50 AM	15	67	0	0	0	113	39	0	1	0	2	0	0	0	0	0	237	
7:55 AM	12	83	0	0	0	103	34	0	4	0	0	0	0	0	0	0	236	1940
8:00 AM	7	58	0	0	0	79	25	0	3	0	1	0	0	0	0	0	173	2027
8:05 AM	2	39	0	0	0	59	24	0	0	0	1	0	0	0	0	0	125	2065
8:10 AM	3	53	0	0	0	75	16	0	1	0	1	0	0	0	0	0	149	2094
8:15 AM	2	35	0	0	0	73	17	0	1	0	0	0	0	0	0	0	128	2113
8:20 AM	1	57	0	0	0	78	12	0	2	0	1	0	0	0	0	0	151	2132
8:25 AM	1	49	0	0	0	54	12	0	1	0	2	0	0	0	0	0	119	2098
8:30 AM	5	48	0	0	0	72	12	0	0	0	1	0	0	0	0	0	138	2084
8:35 AM	5	58	0	0	0	57	8	0	1	0	1	0	0	0	0	0	130	2022
8:40 AM	7	64	0	0	0	58	8	0	6	0	1	0	0	0	0	0	144	1957
8:45 AM	5	68	0	0	0	55	8	0	4	0	4	0	0	0	0	0	144	1874
8:50 AM	5	66	0	0	0	72	12	0	2	0	5	0	0	0	0	0	162	1799
8:55 AM	8	65	0	0	0	63	16	0	0	0	2	0	0	0	0	0	154	1717

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	152	856	0	0	0	1296	456	0	32	0	8	0	0	0	0	0	2800
Heavy Trucks	0	44	0		0	52	0		4	0	0		0	0	0		100
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

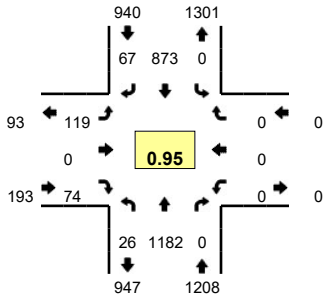
Type of peak hour being reported: Intersection Peak

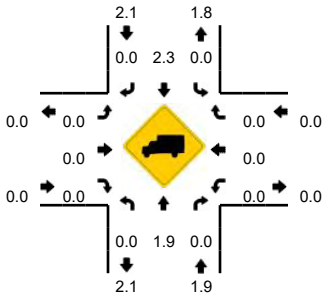
Method for determining peak hour: Total Entering Volume

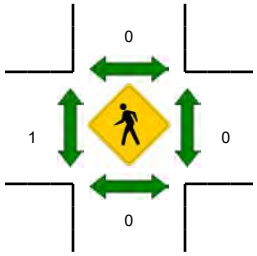
LOCATION: Sierra College Blvd -- Stadium Dwy
CITY/STATE: Placer, CA

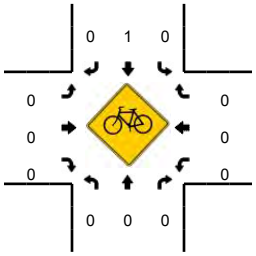
QC JOB #: 13963322
DATE: Wed, Nov 30 2016

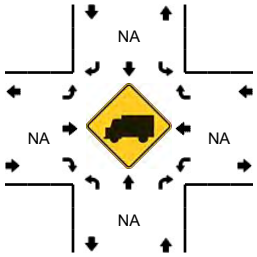
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

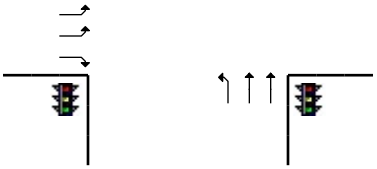


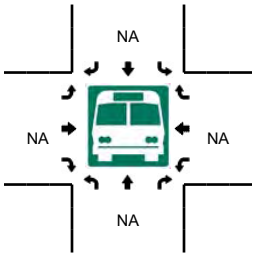












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Stadium Dwy (Eastbound)				Stadium Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	62	0	0	0	63	8	0	6	0	2	0	0	0	0	0	144	
4:05 PM	6	90	0	0	0	80	7	0	9	0	4	0	0	0	0	0	196	
4:10 PM	1	108	0	0	0	64	10	0	8	0	0	0	0	0	0	0	191	
4:15 PM	8	77	0	0	0	76	7	0	19	0	10	0	0	0	0	0	197	
4:20 PM	1	97	0	0	0	81	6	0	18	0	10	0	0	0	0	0	213	
4:25 PM	0	80	0	0	0	60	5	0	7	0	3	0	0	0	0	0	155	
4:30 PM	2	67	0	0	0	58	2	0	7	0	3	0	0	0	0	0	139	
4:35 PM	2	104	0	0	0	58	6	0	6	0	3	0	0	0	0	0	179	
4:40 PM	3	89	0	0	0	63	8	0	8	0	2	0	0	0	0	0	173	
4:45 PM	1	94	0	0	0	79	6	0	5	0	2	0	0	0	0	0	187	
4:50 PM	2	98	0	0	0	76	5	0	10	0	11	0	0	0	0	0	202	
4:55 PM	6	118	0	0	0	65	5	0	11	0	7	0	0	0	0	0	212	2188
5:00 PM	3	88	0	0	0	72	5	0	17	0	11	0	0	0	0	0	196	2240
5:05 PM	1	101	0	0	0	82	7	0	13	0	7	0	0	0	0	0	211	2255
5:10 PM	2	85	0	0	0	73	4	0	21	0	13	0	0	0	0	0	198	2262
5:15 PM	2	99	0	0	0	74	4	0	8	0	4	0	0	0	0	0	191	2256
5:20 PM	3	107	0	0	0	78	5	0	8	0	6	0	0	0	0	0	207	2250
5:25 PM	0	113	0	0	0	84	5	0	6	0	5	0	0	0	0	0	213	2308
5:30 PM	1	86	0	0	0	69	7	0	6	0	3	0	0	0	0	0	172	2341
5:35 PM	2	70	0	0	0	64	8	0	11	0	4	0	0	0	0	0	159	2321
5:40 PM	3	71	0	0	0	92	8	0	4	0	5	0	0	0	0	0	183	2331
5:45 PM	4	65	0	0	0	78	6	0	9	0	6	0	0	0	0	0	168	2312
5:50 PM	3	78	0	0	0	61	7	0	4	0	4	0	0	0	0	0	157	2267
5:55 PM	4	95	0	0	0	70	9	0	9	0	1	0	0	0	0	0	188	2243

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	1228	0	0	0	876	68	0	164	0	100	0	0	0	0	0	2476
Heavy Trucks	0	16	0		0	24	0		0	0	0		0	0	0		40
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

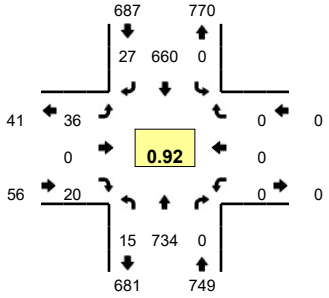
Type of peak hour being reported: Intersection Peak

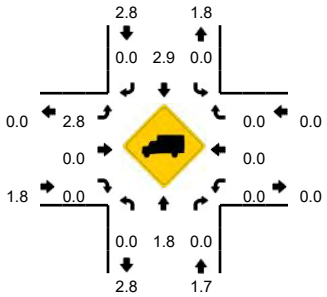
Method for determining peak hour: Total Entering Volume

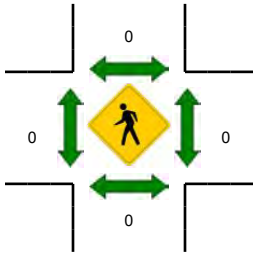
LOCATION: A4 - Sierra†College†Blvd -- Stadium Dwy
CITY/STATE: Placer, CA

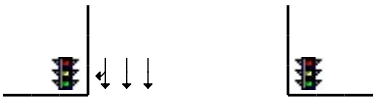
QC JOB #: 14088511
DATE: Sat, Jan 28 2017

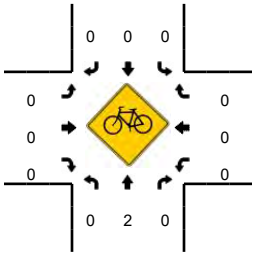
Peak-Hour: 11:55 AM -- 12:55 PM
Peak 15-Min: 11:55 AM -- 12:10 PM

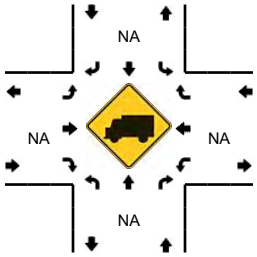


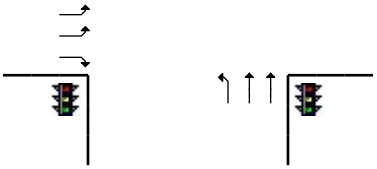


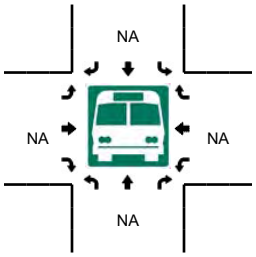












5-Min Count Period Beginning At	A4 - Sierra†College†Blvd (Northbound)				A4 - Sierra†College†Blvd (Southbound)				Stadium Dwy (Eastbound)				Stadium Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	2	67	0	0	0	37	1	0	4	0	4	0	0	0	0	0	115	
11:05 AM	2	40	0	0	0	38	2	0	6	0	1	0	0	0	0	0	89	
11:10 AM	3	56	0	0	0	56	4	0	2	0	3	0	0	0	0	0	124	
11:15 AM	4	63	0	0	0	36	4	0	4	0	3	0	0	0	0	0	114	
11:20 AM	6	53	0	0	0	51	6	0	3	0	6	0	0	0	0	0	125	
11:25 AM	3	40	0	0	0	52	6	0	3	0	1	0	0	0	0	0	105	
11:30 AM	3	64	0	0	0	48	7	0	0	0	4	0	0	0	0	0	126	
11:35 AM	1	63	0	0	0	37	3	0	2	0	1	0	0	0	0	0	107	
11:40 AM	3	59	0	0	0	50	2	0	1	0	0	0	0	0	0	0	115	
11:45 AM	3	62	0	0	0	48	2	0	0	0	4	0	0	0	0	0	119	
11:50 AM	4	62	0	0	0	47	0	0	10	0	1	0	0	0	0	0	124	
11:55 AM	0	65	0	1	0	62	3	0	7	0	7	0	0	0	0	0	145	1408
12:00 PM	0	53	0	0	0	57	4	0	8	0	1	0	0	0	0	0	123	1416
12:05 PM	1	73	0	0	0	45	3	0	10	0	6	0	0	0	0	0	138	1465
12:10 PM	0	54	0	0	0	36	1	0	3	0	1	0	0	0	0	0	95	1436
12:15 PM	2	54	0	0	0	66	1	0	1	0	1	0	0	0	0	0	125	1447
12:20 PM	1	55	0	0	0	65	1	0	3	0	0	0	0	0	0	0	125	1447
12:25 PM	2	47	0	0	0	49	2	0	1	0	0	0	0	0	0	0	101	1443
12:30 PM	0	75	0	0	0	67	4	0	1	0	1	0	0	0	0	0	148	1465
12:35 PM	2	62	0	0	0	64	0	0	2	0	1	0	0	0	0	0	131	1489
12:40 PM	2	64	0	0	0	46	0	0	0	0	1	0	0	0	0	0	113	1487
12:45 PM	2	58	0	0	0	50	1	0	0	0	0	0	0	0	0	0	111	1479
12:50 PM	2	74	0	0	0	53	7	0	0	0	1	0	0	0	0	0	137	1492
12:55 PM	1	54	0	0	0	59	4	0	4	0	0	0	0	0	0	0	122	1469

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	764	0	4	0	656	40	0	100	0	56	0	0	0	0	0	1624
Heavy Trucks	0	16	0		0	20	0		4	0	0		0	0	0		40
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

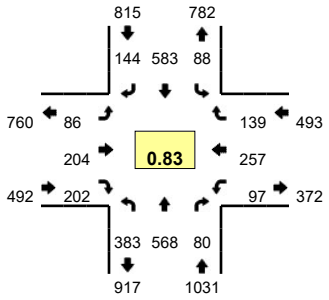
Type of peak hour being reported: Intersection Peak

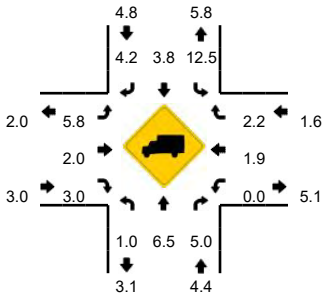
Method for determining peak hour: Total Entering Volume

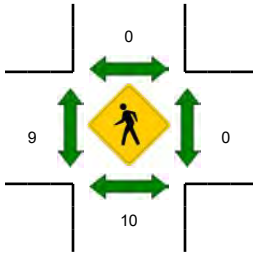
LOCATION: Sierra College Blvd -- Rocklin Rd
CITY/STATE: Placer, CA

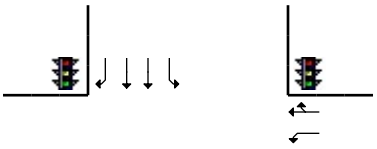
QC JOB #: 13963323
DATE: Thu, Nov 17 2016

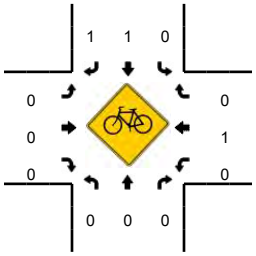
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

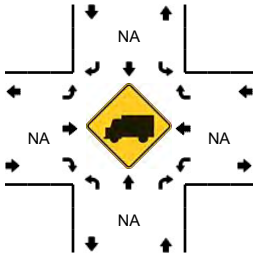


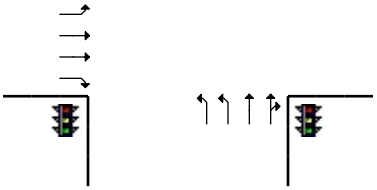


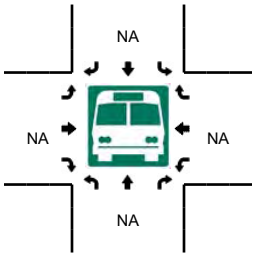












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	19	34	4	6	13	27	10	0	2	5	11	0	2	13	5	0	151	
7:05 AM	21	41	3	3	8	37	10	0	3	15	12	3	2	12	4	0	174	
7:10 AM	29	39	7	2	7	29	11	0	6	14	10	0	3	11	9	0	177	
7:15 AM	20	47	2	3	7	43	14	0	9	10	11	0	8	17	7	0	198	
7:20 AM	21	38	4	8	5	36	8	0	2	17	8	1	3	17	10	0	178	
7:25 AM	20	46	3	4	5	44	6	0	4	10	14	0	8	16	14	0	194	
7:30 AM	26	45	6	2	9	43	19	0	6	23	16	0	8	20	9	0	232	
7:35 AM	27	64	11	4	2	50	14	0	4	14	22	0	0	16	11	0	239	
7:40 AM	30	57	5	3	5	49	16	0	10	16	22	3	10	21	7	0	254	
7:45 AM	34	55	7	2	3	53	16	0	8	11	11	4	9	24	11	0	248	
7:50 AM	62	57	5	8	12	61	20	0	6	17	18	0	4	28	9	0	307	
7:55 AM	56	48	12	1	11	40	16	0	9	19	12	3	12	37	18	0	294	2646
8:00 AM	23	30	4	1	9	48	8	0	5	19	19	1	11	26	17	0	221	2716
8:05 AM	8	42	5	3	4	52	14	0	10	20	18	0	10	16	9	0	211	2753
8:10 AM	25	43	8	5	9	43	6	0	3	12	13	0	8	13	9	0	197	2773
8:15 AM	18	44	8	0	8	58	2	0	7	16	18	0	13	15	14	0	221	2796
8:20 AM	19	37	6	2	11	42	7	0	3	27	19	0	4	25	11	0	213	2831
8:25 AM	13	32	8	3	4	53	10	0	1	14	8	0	12	17	5	0	180	2817
8:30 AM	10	44	2	3	9	54	6	0	10	17	20	0	7	22	8	0	212	2797
8:35 AM	21	30	3	4	8	43	5	0	5	15	19	0	15	24	9	0	201	2759
8:40 AM	19	33	4	1	6	45	4	0	3	14	20	0	5	19	13	0	186	2691
8:45 AM	8	44	5	4	7	33	6	0	7	19	17	0	7	21	6	0	184	2627
8:50 AM	17	35	1	4	0	35	5	0	15	22	22	0	7	17	9	0	189	2509
8:55 AM	24	37	1	1	7	53	10	0	9	16	13	3	6	14	11	0	205	2420

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	608	640	96	44	104	616	208	0	92	188	164	28	100	356	152	0	3396
Heavy Trucks	4	40	4		16	20	4		4	0	0		0	12	0		104
Pedestrians		20				0				20				0			40
Bicycles	0	0	0		0	1	0		0	0	0		0	1	0		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

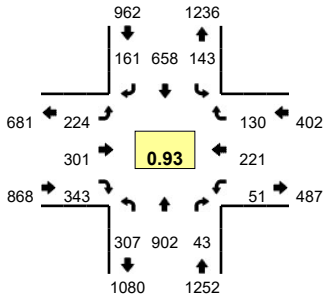
Type of peak hour being reported: Intersection Peak

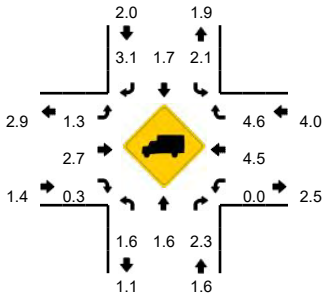
Method for determining peak hour: Total Entering Volume

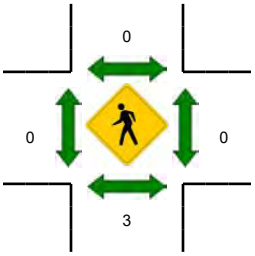
LOCATION: Sierra College Blvd -- Rocklin Rd
CITY/STATE: Placer, CA

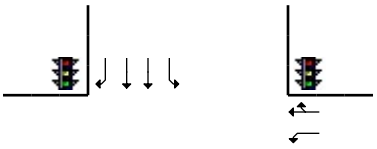
QC JOB #: 13963324
DATE: Thu, Nov 17 2016

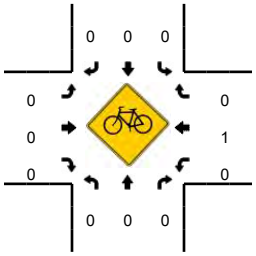
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

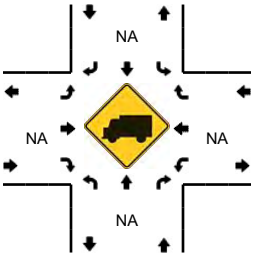


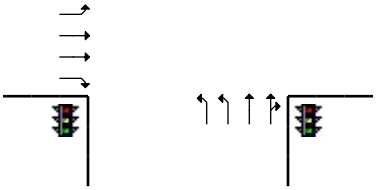


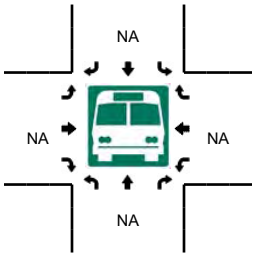












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	20	36	3	0	10	34	12	0	10	22	18	1	3	11	12	0	192	
4:05 PM	17	65	6	1	12	58	7	0	18	28	27	0	7	8	11	0	265	
4:10 PM	27	68	4	0	5	35	7	0	14	26	24	1	4	24	9	0	248	
4:15 PM	17	71	11	0	18	40	13	1	23	35	25	1	8	9	10	0	282	
4:20 PM	20	65	8	0	12	68	4	0	7	16	23	0	5	14	8	0	250	
4:25 PM	20	91	4	2	6	41	13	0	8	23	27	2	5	13	9	0	264	
4:30 PM	23	67	5	2	15	51	5	0	8	16	15	0	1	25	7	0	240	
4:35 PM	23	53	6	1	6	49	10	0	19	20	22	0	9	11	12	0	241	
4:40 PM	23	74	3	4	7	42	17	0	22	25	34	5	3	23	9	0	291	
4:45 PM	18	46	1	2	17	43	12	0	11	23	30	1	4	27	8	0	243	
4:50 PM	19	97	4	2	10	56	11	0	17	16	36	0	1	13	13	0	295	
4:55 PM	20	47	0	3	11	33	17	0	33	38	41	2	6	23	15	0	289	3100
5:00 PM	24	77	4	2	11	67	15	0	26	10	33	0	7	8	12	0	296	3204
5:05 PM	36	70	1	1	16	72	11	0	20	45	29	3	5	13	10	0	332	3271
5:10 PM	17	90	4	2	9	55	14	0	18	32	18	1	2	20	8	0	290	3313
5:15 PM	26	94	5	2	16	50	14	0	16	26	35	0	4	19	6	0	313	3344
5:20 PM	27	85	5	3	8	70	15	0	9	14	22	5	5	18	9	0	295	3389
5:25 PM	17	71	6	2	4	47	11	0	4	37	26	1	7	25	21	0	279	3404
5:30 PM	26	70	9	2	19	73	11	0	13	16	18	1	2	13	12	0	285	3449
5:35 PM	26	81	1	3	15	50	13	0	15	19	21	1	5	19	7	0	276	3484
5:40 PM	24	65	4	3	12	32	13	0	16	22	25	3	2	31	6	0	258	3451
5:45 PM	27	56	4	3	9	42	11	0	9	33	17	4	5	19	15	0	254	3462
5:50 PM	18	59	3	2	9	36	15	1	11	25	16	1	4	12	6	0	218	3385
5:55 PM	25	48	3	2	7	48	10	0	7	27	29	0	1	19	9	0	235	3331

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	316	1016	40	20	164	708	156	0	216	412	328	16	44	208	96	0	3740
Heavy Trucks	0	4	0		8	4	8		4	12	4		0	12	4		60
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

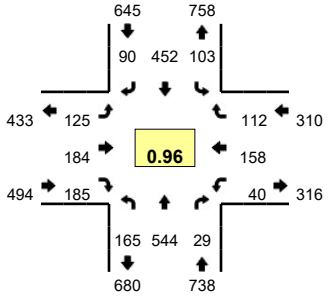
LOCATION: A5 -Sierra†College†Blvd -- Rocklin†Rd

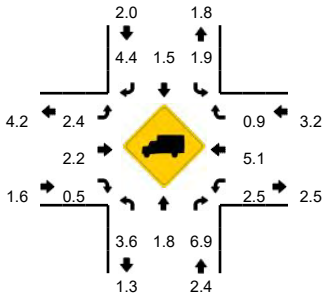
CITY/STATE: Placer, CA

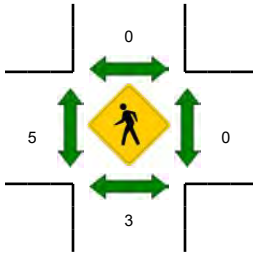
QC JOB #: 14088512

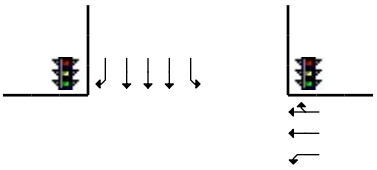
DATE: Sat, Jan 28 2017

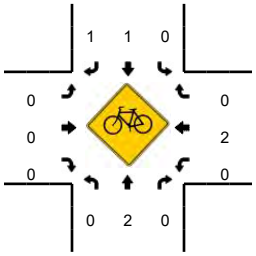
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:45 PM -- 1:00 PM

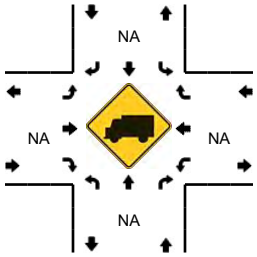


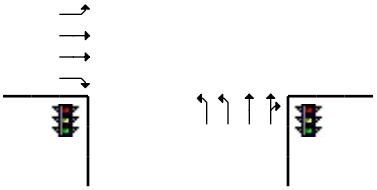


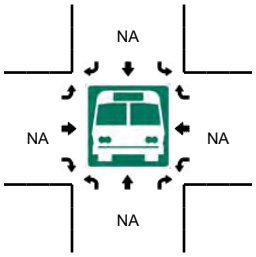












5-Min Count Period Beginning At	A5 -Sierra†College†Blvd (Northbound)				A5 -Sierra†College†Blvd (Southbound)				Rocklin†Rd (Eastbound)				Rocklin†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	12	48	4	0	5	28	6	0	13	12	23	4	3	14	7	0	179	
11:05 AM	10	32	2	0	7	28	12	0	9	13	14	1	2	13	10	0	153	
11:10 AM	6	36	3	1	3	36	4	0	11	11	19	5	1	6	5	0	147	
11:15 AM	6	42	7	0	7	26	8	0	15	17	20	1	1	12	9	0	171	
11:20 AM	21	50	4	0	7	41	8	0	10	16	15	2	1	10	5	0	190	
11:25 AM	8	23	2	0	10	41	10	1	10	10	16	1	4	12	8	0	156	
11:30 AM	11	47	4	0	6	34	5	0	8	11	11	1	6	12	10	0	166	
11:35 AM	16	47	2	0	6	32	5	0	7	15	15	4	3	8	7	0	167	
11:40 AM	21	45	1	0	4	38	7	0	13	15	20	1	2	11	7	0	185	
11:45 AM	12	43	4	0	6	32	8	0	12	10	14	2	2	10	7	0	162	
11:50 AM	13	58	2	0	14	32	7	0	10	19	25	0	8	31	10	0	229	
11:55 AM	9	41	0	0	6	45	8	0	9	8	13	0	1	13	5	0	158	2063
12:00 PM	11	37	4	0	6	39	9	0	7	12	11	1	3	13	8	0	161	2045
12:05 PM	14	54	3	0	6	31	6	0	9	17	15	3	5	15	9	0	187	2079
12:10 PM	13	37	5	0	5	39	6	0	11	10	21	2	2	7	11	0	169	2101
12:15 PM	18	32	2	0	9	40	9	0	9	17	16	2	7	19	9	0	189	2119
12:20 PM	13	50	0	0	5	45	9	0	3	19	17	4	2	15	4	0	186	2115
12:25 PM	14	56	1	0	8	46	2	0	3	12	14	4	6	12	9	0	187	2146
12:30 PM	9	42	2	1	12	35	6	0	8	16	12	1	1	23	9	0	177	2157
12:35 PM	14	54	3	0	14	31	5	0	9	17	12	0	3	9	9	0	180	2170
12:40 PM	18	40	1	0	5	33	9	0	14	18	19	3	2	11	11	0	184	2169
12:45 PM	15	37	6	0	7	33	8	0	13	14	15	2	1	11	15	0	177	2184
12:50 PM	18	60	1	2	11	37	11	0	7	10	10	1	2	11	9	0	190	2145
12:55 PM	5	45	1	0	15	43	10	0	9	22	23	0	6	12	9	0	200	2187

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	152	568	32	8	132	452	116	0	116	184	192	12	36	136	132	0	2268
Heavy Trucks	8	16	0		4	12	8		4	0	0		4	12	4		72
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

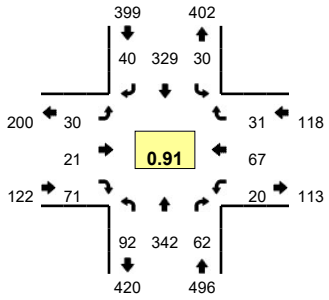
Type of peak hour being reported: Intersection Peak

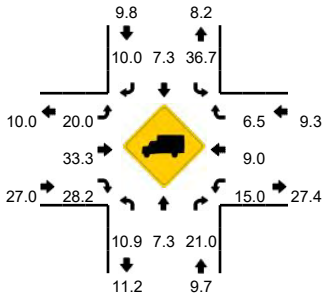
Method for determining peak hour: Total Entering Volume

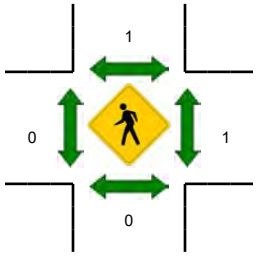
LOCATION: Pacific St -- Dominguez Rd/Delmar Ave
CITY/STATE: Placer, CA

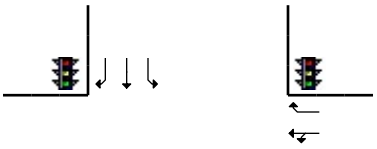
QC JOB #: 13963331
DATE: Thu, Nov 17 2016

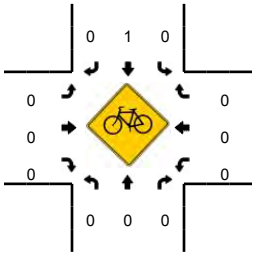
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

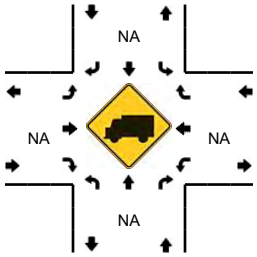


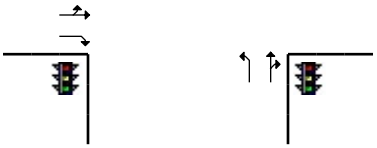


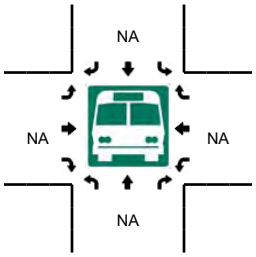












5-Min Count Period Beginning At	Pacific St (Northbound)				Pacific St (Southbound)				Dominguez Rd/Delmar Ave (Eastbound)				Dominguez Rd/Delmar Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	15	3	0	3	18	2	0	1	5	2	0	3	9	1	0	69	
7:05 AM	6	19	3	0	0	15	1	0	1	2	3	0	1	2	2	0	55	
7:10 AM	1	26	2	0	2	15	4	0	2	4	6	0	2	3	0	0	67	
7:15 AM	6	26	3	0	3	25	1	0	2	1	3	0	1	9	2	0	82	
7:20 AM	10	15	4	0	4	18	2	0	0	2	3	0	3	6	1	0	68	
7:25 AM	2	33	0	0	1	12	2	0	0	1	9	0	6	1	4	0	71	
7:30 AM	5	34	5	0	3	21	2	0	1	3	4	0	0	3	2	0	83	
7:35 AM	5	34	2	0	0	21	3	0	2	1	3	0	4	4	1	0	80	
7:40 AM	6	20	7	0	3	31	3	0	6	1	12	0	6	4	4	0	103	
7:45 AM	11	39	7	0	1	41	5	0	2	3	8	0	0	6	1	0	124	
7:50 AM	11	33	4	0	3	19	3	0	1	0	5	0	1	6	0	0	86	
7:55 AM	8	32	5	0	2	23	2	0	1	1	2	0	2	10	4	0	92	980
8:00 AM	7	31	2	0	2	38	4	0	1	1	5	0	1	6	2	0	100	1011
8:05 AM	9	27	7	0	3	19	6	0	3	1	6	0	0	6	3	0	90	1046
8:10 AM	7	23	2	0	4	17	3	0	2	0	7	1	2	4	0	0	72	1051
8:15 AM	5	32	5	0	3	34	5	0	3	4	6	0	2	7	3	0	109	1078
8:20 AM	10	27	8	0	5	27	1	0	5	3	3	0	0	1	3	0	93	1103
8:25 AM	5	26	6	0	1	33	1	0	1	3	5	0	1	9	6	0	97	1129
8:30 AM	6	31	4	0	2	20	2	0	3	0	8	0	1	5	3	0	85	1131
8:35 AM	7	21	5	0	1	27	5	0	1	4	4	0	4	3	2	0	84	1135
8:40 AM	8	36	3	0	2	9	1	0	2	2	7	0	3	2	6	0	81	1113
8:45 AM	3	18	4	0	1	33	0	0	2	4	7	0	3	2	0	0	77	1066
8:50 AM	0	24	4	0	0	39	2	0	3	1	3	0	1	3	4	0	84	1064
8:55 AM	9	22	2	0	0	15	1	0	1	2	4	0	1	4	2	0	63	1035

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	112	368	72	0	28	364	44	0	36	16	100	0	28	64	20	0	1252
Heavy Trucks	8	16	12		8	24	4		8	12	36		4	4	4		140
Pedestrians		0				4				0				4			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

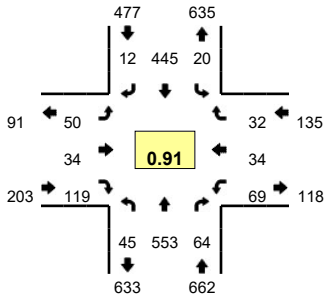
Type of peak hour being reported: Intersection Peak

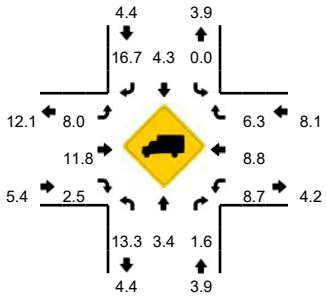
Method for determining peak hour: Total Entering Volume

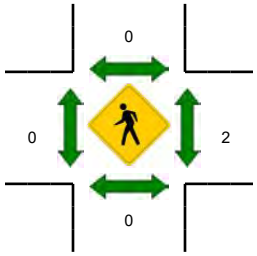
LOCATION: Pacific St -- Dominguez Rd/Delmar Ave
CITY/STATE: Placer, CA

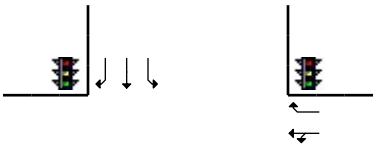
QC JOB #: 13963332
DATE: Thu, Nov 17 2016

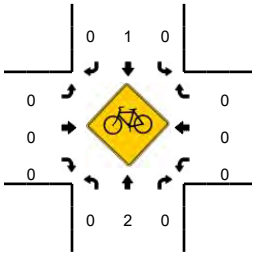
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

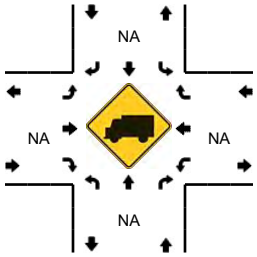


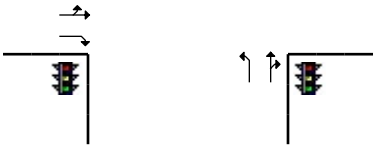


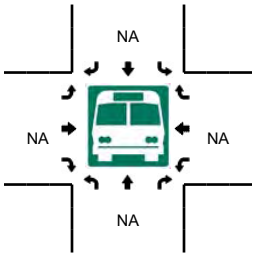












5-Min Count Period Beginning At	Pacific St (Northbound)				Pacific St (Southbound)				Dominguez Rd/Delmar Ave (Eastbound)				Dominguez Rd/Delmar Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	50	5	0	0	36	1	0	8	2	10	0	9	5	1	0	136	
4:05 PM	4	47	8	0	2	35	1	0	6	5	20	0	4	3	2	0	137	
4:10 PM	6	52	5	0	2	39	0	0	7	3	13	0	2	5	1	0	135	
4:15 PM	4	59	6	0	3	26	2	0	5	3	8	0	5	1	4	0	126	
4:20 PM	0	31	1	0	2	36	0	0	1	3	12	0	9	2	10	0	107	
4:25 PM	2	53	7	0	1	49	1	0	4	1	3	0	5	2	4	0	132	
4:30 PM	5	48	4	0	2	38	0	0	3	3	14	0	5	1	3	0	126	
4:35 PM	4	46	6	0	4	28	1	0	2	4	10	0	9	3	3	0	120	
4:40 PM	4	52	4	0	0	39	3	0	7	2	5	0	6	5	2	0	129	
4:45 PM	5	29	4	0	2	52	1	0	1	1	11	0	7	2	0	0	115	
4:50 PM	2	42	9	0	2	28	0	0	3	2	8	0	3	2	1	0	102	
4:55 PM	0	44	5	0	0	39	2	0	3	5	5	0	5	3	1	0	112	1477
5:00 PM	4	46	0	0	2	42	1	0	0	6	8	0	12	2	1	0	124	1465
5:05 PM	1	67	2	0	3	32	0	0	3	2	16	0	4	0	3	0	133	1461
5:10 PM	1	53	2	0	1	43	2	0	3	4	11	0	11	3	0	0	134	1460
5:15 PM	1	41	0	0	0	52	0	0	5	4	4	0	11	1	5	0	124	1458
5:20 PM	0	48	4	0	0	46	0	0	4	1	7	0	3	1	1	0	115	1466
5:25 PM	1	35	3	0	1	36	2	0	2	0	4	0	11	3	0	0	98	1432
5:30 PM	2	56	4	0	1	34	1	0	0	5	6	0	3	3	1	0	116	1422
5:35 PM	2	57	6	0	1	31	0	0	2	3	9	0	3	1	1	0	116	1418
5:40 PM	1	35	2	0	0	36	0	0	0	1	5	0	9	2	0	0	91	1380
5:45 PM	2	35	7	0	0	33	2	0	0	2	4	0	1	1	0	0	87	1352
5:50 PM	2	38	2	0	2	21	0	0	1	2	3	0	0	3	1	0	75	1325
5:55 PM	1	35	7	0	1	35	1	0	3	2	3	0	3	2	1	0	94	1307

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	76	596	72	0	16	440	8	0	84	40	172	0	60	52	16	0	1632
Heavy Trucks	4	24	4		0	16	0		4	12	0		4	8	0		76
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

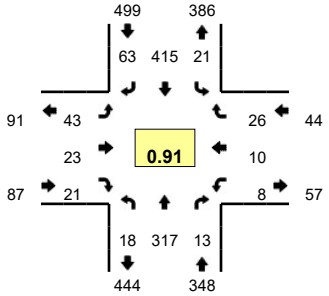
Type of peak hour being reported: Intersection Peak

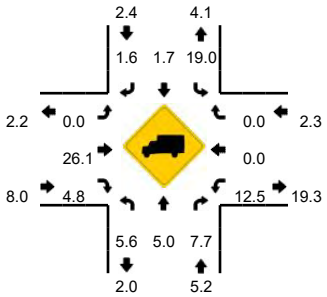
Method for determining peak hour: Total Entering Volume

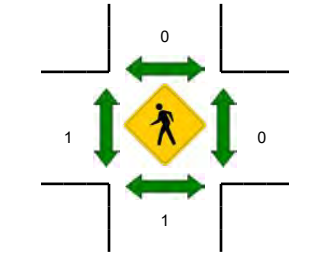
LOCATION: B11 - Pacific†St -- Dominguez†Rd/Delmar Ave
CITY/STATE: Rocklin, CA

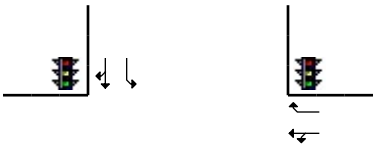
QC JOB #: 14088516
DATE: Sat, Jan 28 2017

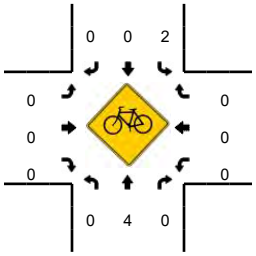
Peak-Hour: 11:55 AM -- 12:55 PM
Peak 15-Min: 12:10 PM -- 12:25 PM

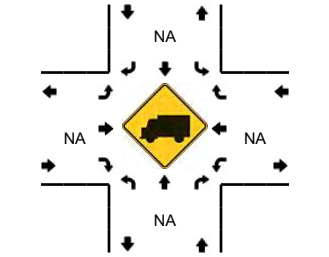


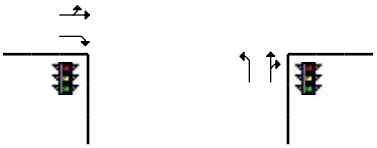


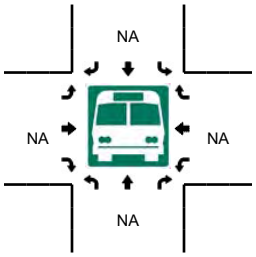












5-Min Count Period Beginning At	B11 - Pacific†St (Northbound)				B11 - Pacific†St (Southbound)				Dominguez†Rd/Delmar Ave (Eastbound)				Dominguez†Rd/Delmar Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	2	20	4	0	0	25	4	0	2	2	1	0	1	2	3	0	66	
11:05 AM	0	29	1	0	3	21	4	0	1	0	4	0	0	2	2	0	67	
11:10 AM	3	27	1	0	2	24	3	0	4	0	0	0	1	3	1	0	69	
11:15 AM	3	23	0	0	1	36	9	0	0	2	2	0	2	1	4	0	83	
11:20 AM	2	28	2	0	1	19	2	0	3	1	1	0	1	2	3	0	65	
11:25 AM	1	18	1	0	2	33	4	0	4	2	0	0	0	0	5	0	70	
11:30 AM	2	22	1	0	0	31	1	0	2	2	2	0	1	1	0	0	65	
11:35 AM	0	17	0	0	3	32	2	0	4	1	4	0	1	2	1	0	67	
11:40 AM	1	29	2	0	5	22	3	0	3	1	1	0	4	0	2	0	73	
11:45 AM	3	19	1	0	3	21	5	0	1	1	2	0	2	2	2	0	62	
11:50 AM	1	18	0	0	0	29	1	0	2	4	0	0	2	0	3	0	60	
11:55 AM	3	32	2	0	2	33	6	0	1	1	2	0	0	2	0	0	84	831
12:00 PM	0	27	0	0	3	27	5	0	1	4	2	0	0	2	1	0	72	837
12:05 PM	2	19	1	0	4	36	9	0	6	5	2	0	0	1	4	0	89	859
12:10 PM	0	31	1	0	2	36	4	0	4	1	2	0	1	2	3	0	87	877
12:15 PM	1	26	1	0	1	27	8	0	3	4	2	0	0	1	2	0	76	870
12:20 PM	3	30	0	0	3	49	8	0	4	1	2	0	2	0	3	0	105	910
12:25 PM	2	33	2	0	0	29	0	0	2	0	1	0	1	1	3	0	74	914
12:30 PM	2	24	0	0	1	40	5	0	2	0	1	0	1	0	2	0	78	927
12:35 PM	3	22	2	0	3	31	7	0	6	1	2	0	0	0	0	0	77	937
12:40 PM	1	26	2	0	1	44	2	0	5	3	2	0	2	0	1	0	89	953
12:45 PM	0	24	1	0	0	35	2	0	3	2	3	0	1	1	3	0	75	966
12:50 PM	1	23	1	0	1	28	7	0	6	1	0	0	0	0	4	0	72	978
12:55 PM	1	20	1	0	2	30	6	0	6	0	0	0	0	1	2	0	69	963

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	348	8	0	24	448	80	0	44	24	24	0	12	12	32	0	1072
Heavy Trucks	0	12	0		4	4	0		0	16	4		0	0	0		40
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

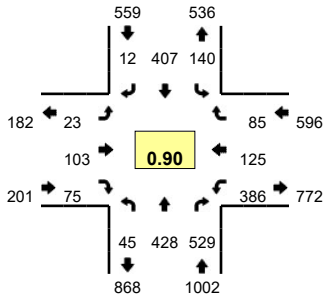
Type of peak hour being reported: Intersection Peak

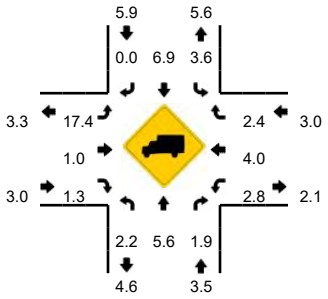
Method for determining peak hour: Total Entering Volume

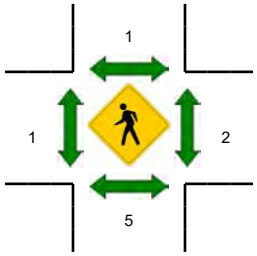
LOCATION: Pacific St -- Rocklin Rd
CITY/STATE: Placer, CA

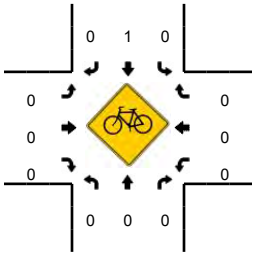
QC JOB #: 13963329
DATE: Thu, Nov 17 2016

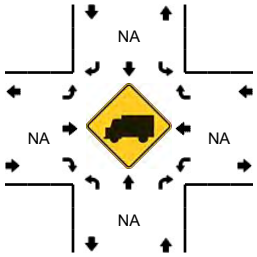
Peak-Hour: 7:35 AM -- 8:35 AM
Peak 15-Min: 7:55 AM -- 8:10 AM

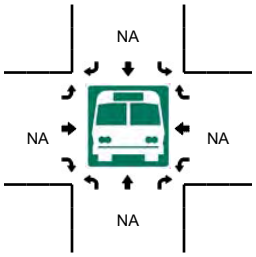












5-Min Count Period Beginning At	Pacific St (Northbound)				Pacific St (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	16	18	1	11	20	0	0	1	2	3	0	12	2	4	0	90	
7:05 AM	1	18	20	0	7	27	0	0	2	3	3	0	10	4	4	0	99	
7:10 AM	6	21	21	0	6	16	2	0	0	3	1	0	11	4	5	0	96	
7:15 AM	3	26	17	0	11	18	2	0	0	8	3	0	14	3	4	0	109	
7:20 AM	3	25	25	0	9	26	0	0	1	5	4	0	11	10	9	0	128	
7:25 AM	0	25	34	0	16	27	3	0	0	14	3	0	28	5	3	0	158	
7:30 AM	2	28	36	0	18	26	1	0	1	7	2	0	18	0	7	0	146	
7:35 AM	1	32	45	0	13	37	0	0	2	3	3	0	20	3	8	0	167	
7:40 AM	2	30	41	0	13	32	0	0	2	4	6	0	14	9	2	0	155	
7:45 AM	0	40	50	0	15	38	0	0	0	10	2	0	28	9	8	0	200	
7:50 AM	1	41	47	0	14	36	2	0	7	9	1	0	36	0	7	0	201	
7:55 AM	3	37	58	0	15	42	3	0	4	4	4	0	25	5	11	0	211	1760
8:00 AM	4	41	66	0	11	28	3	0	0	8	6	0	36	18	11	0	232	1902
8:05 AM	5	41	50	0	11	29	0	0	1	13	7	0	35	12	8	0	212	2015
8:10 AM	8	31	46	0	5	33	1	0	2	11	6	0	34	13	5	0	195	2114
8:15 AM	10	33	45	0	17	27	0	0	2	9	16	0	48	26	7	0	240	2245
8:20 AM	6	44	24	0	10	36	2	0	1	12	12	0	38	18	5	0	208	2325
8:25 AM	2	28	26	0	11	36	0	0	1	15	8	0	49	7	7	0	190	2357
8:30 AM	3	30	31	0	5	33	1	0	1	5	4	0	23	5	6	0	147	2358
8:35 AM	1	25	13	0	9	37	1	0	1	5	0	0	28	3	9	0	132	2323
8:40 AM	0	36	37	0	12	37	0	0	2	1	0	0	25	2	9	0	161	2329
8:45 AM	0	28	27	1	9	31	0	0	1	3	6	0	16	6	11	0	139	2268
8:50 AM	2	17	25	0	15	47	2	0	0	11	0	0	11	3	5	0	138	2205
8:55 AM	3	33	34	0	4	34	1	0	3	5	4	0	17	2	9	0	149	2143

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	476	696	0	148	396	24	0	20	100	68	0	384	140	120	0	2620
Heavy Trucks	0	28	20		4	24	0		4	0	0		4	0	0		84
Pedestrians		16				0				0				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

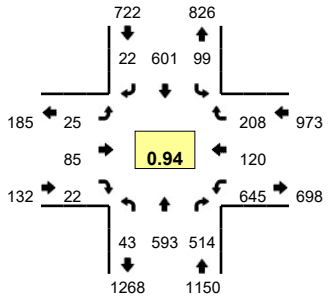
Type of peak hour being reported: Intersection Peak

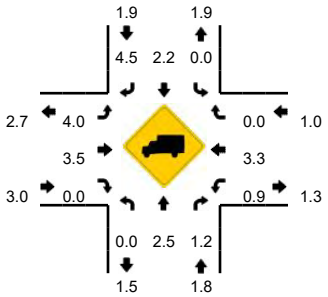
Method for determining peak hour: Total Entering Volume

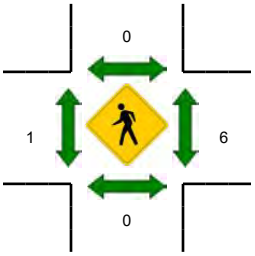
LOCATION: Pacific St -- Rocklin Rd
CITY/STATE: Placer, CA

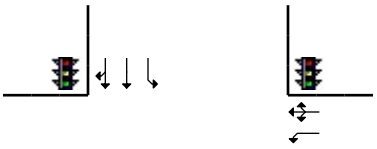
QC JOB #: 13963330
DATE: Thu, Nov 17 2016

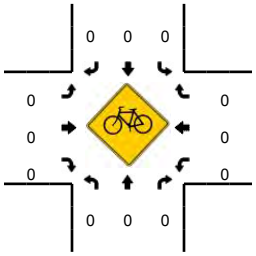
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

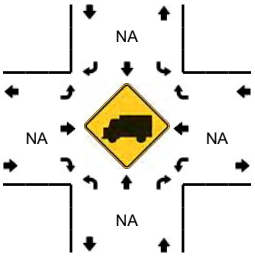


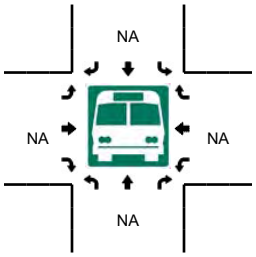












5-Min Count Period Beginning At	Pacific St (Northbound)				Pacific St (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	53	41	0	6	48	7	0	1	7	1	0	57	8	26	0	259	
4:05 PM	4	45	48	0	7	57	2	0	0	4	3	0	61	9	10	0	250	
4:10 PM	2	58	39	0	9	40	0	0	1	2	3	0	48	11	12	0	225	
4:15 PM	2	50	46	0	10	34	1	0	1	4	1	0	43	5	11	0	208	
4:20 PM	2	52	45	0	8	47	5	0	1	7	5	0	54	10	12	0	248	
4:25 PM	8	51	42	0	13	44	1	0	4	7	7	0	38	3	6	0	224	
4:30 PM	1	56	40	0	9	46	0	0	2	4	2	0	34	6	7	0	207	
4:35 PM	2	46	51	0	12	55	2	0	2	5	3	0	54	9	13	0	254	
4:40 PM	3	43	33	0	6	32	1	0	1	3	4	0	48	11	17	0	202	
4:45 PM	3	32	37	0	14	35	1	0	2	5	1	0	53	10	22	0	215	
4:50 PM	1	55	42	0	4	55	3	0	2	14	1	0	49	8	15	0	249	
4:55 PM	8	50	49	0	9	48	0	0	3	5	3	0	52	7	17	0	251	2792
5:00 PM	5	57	38	0	5	52	2	0	1	5	2	0	55	6	23	0	251	2784
5:05 PM	5	51	55	0	10	63	3	0	1	4	0	0	59	12	20	0	283	2817
5:10 PM	3	50	47	0	7	58	3	0	4	7	2	0	44	10	12	0	247	2839
5:15 PM	2	51	44	0	6	64	3	0	0	7	0	0	57	9	17	0	260	2891
5:20 PM	6	37	40	0	11	51	2	0	4	8	2	0	65	10	19	0	255	2898
5:25 PM	2	65	39	0	10	52	0	0	4	9	3	0	60	16	17	0	277	2951
5:30 PM	3	56	39	0	5	36	2	0	1	13	1	0	49	12	16	0	233	2977
5:35 PM	3	45	29	0	4	32	2	0	5	3	0	0	68	15	17	0	223	2946
5:40 PM	3	42	25	0	10	34	3	0	2	5	1	0	53	18	13	0	209	2953
5:45 PM	3	51	36	0	9	27	2	0	4	9	3	0	39	12	21	0	216	2954
5:50 PM	6	47	42	0	7	27	3	0	4	7	1	0	36	13	12	0	205	2910
5:55 PM	4	36	29	0	10	27	3	0	1	7	3	0	42	9	9	0	180	2839

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	612	492	0	108	668	20	0	32	96	20	0	728	140	212	0	3168
Heavy Trucks	0	8	4		0	20	0		4	4	0		12	8	0		60
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

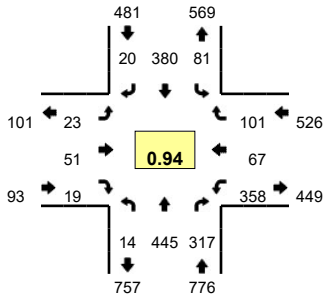
Type of peak hour being reported: Intersection Peak

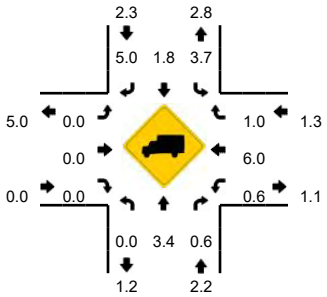
Method for determining peak hour: Total Entering Volume

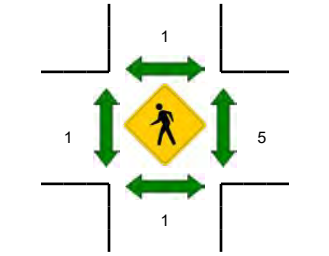
LOCATION: A10 - Pacific†St -- Rocklin†Rd
CITY/STATE: Placer, CA

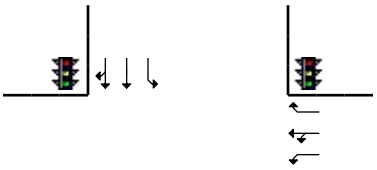
QC JOB #: 14088515
DATE: Sat, Jan 28 2017

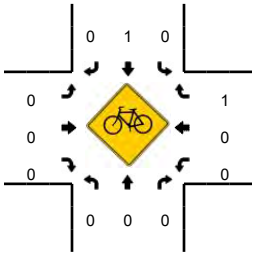
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:45 PM -- 1:00 PM

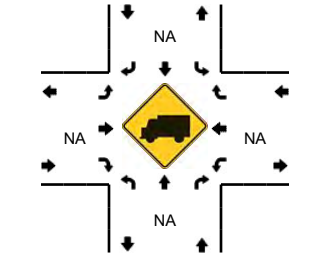


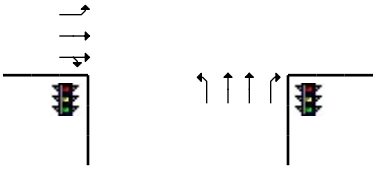


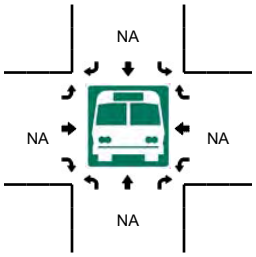












5-Min Count Period Beginning At	A10 - Pacific†St (Northbound)				A10 - Pacific†St (Southbound)				Rocklin†Rd (Eastbound)				Rocklin†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	1	21	18	0	5	21	1	0	2	1	2	0	24	9	14	0	119	
11:05 AM	0	39	21	0	8	39	0	0	1	2	1	0	31	14	8	0	164	
11:10 AM	0	38	26	0	12	40	2	0	0	8	3	0	26	9	7	0	171	
11:15 AM	4	40	27	0	9	21	0	0	0	1	1	0	27	5	4	0	139	
11:20 AM	1	35	22	0	9	35	1	0	3	2	1	0	22	3	10	0	144	
11:25 AM	2	23	20	0	12	31	2	0	2	5	0	0	29	5	7	0	138	
11:30 AM	1	30	33	0	6	33	1	0	1	4	6	0	24	2	9	0	150	
11:35 AM	1	32	35	0	8	35	1	0	2	3	1	0	31	4	9	0	162	
11:40 AM	2	20	22	0	7	27	0	0	1	5	2	0	23	4	12	0	125	
11:45 AM	1	29	30	0	6	23	3	0	1	4	3	0	43	2	5	0	150	
11:50 AM	0	26	31	0	5	32	1	0	3	2	4	0	13	6	11	0	134	
11:55 AM	4	34	18	0	10	25	0	0	5	10	2	0	28	6	8	0	150	1746
12:00 PM	0	42	28	0	10	27	1	0	5	9	3	0	37	5	7	0	174	1801
12:05 PM	2	40	28	0	6	28	0	0	2	5	0	0	40	3	13	0	167	1804
12:10 PM	0	35	24	0	10	31	0	0	2	2	0	0	21	7	6	0	138	1771
12:15 PM	0	50	33	0	2	35	1	0	0	7	2	0	26	6	10	0	172	1804
12:20 PM	0	39	28	0	9	29	5	0	0	0	0	0	26	5	9	0	150	1810
12:25 PM	5	30	17	0	5	39	1	0	1	4	3	0	27	5	6	0	143	1815
12:30 PM	0	31	22	0	6	24	1	0	3	4	2	0	26	8	9	0	136	1801
12:35 PM	0	40	25	0	7	33	1	0	2	7	3	0	22	2	8	0	150	1789
12:40 PM	2	31	22	0	4	33	2	0	1	6	1	0	27	9	11	0	149	1813
12:45 PM	0	43	30	0	4	37	4	0	1	2	2	0	38	5	9	0	175	1838
12:50 PM	4	27	29	0	8	35	3	0	2	2	1	0	30	3	8	0	152	1856
12:55 PM	1	37	31	0	10	29	1	0	4	3	2	0	38	9	5	0	170	1876

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	428	360	0	88	404	32	0	28	28	20	0	424	68	88	0	1988
Heavy Trucks	0	8	0		4	4	4		0	0	0		0	0	4		24
Pedestrians		0				0				0				16			16
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

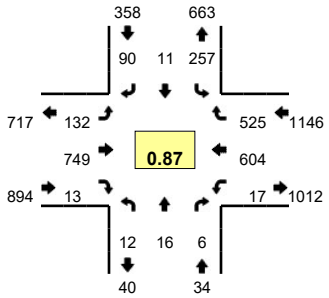
Type of peak hour being reported: Intersection Peak

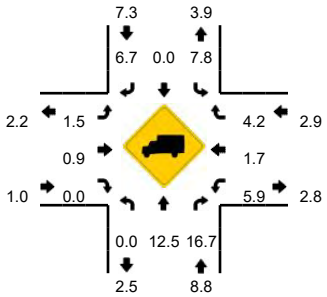
Method for determining peak hour: Total Entering Volume

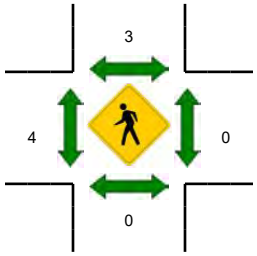
LOCATION: Granite Dr -- Rocklin Rd
CITY/STATE: Placer, CA

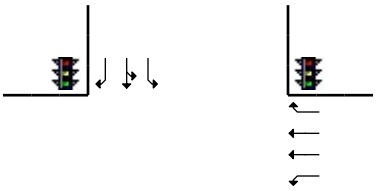
QC JOB #: 13963327
DATE: Thu, Nov 17 2016

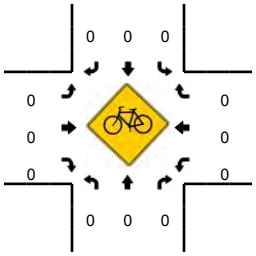
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

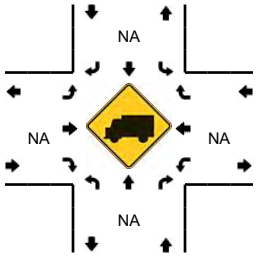


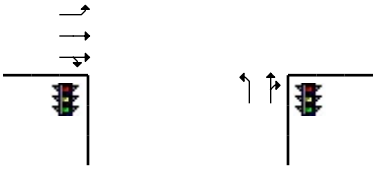


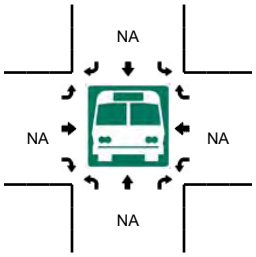












5-Min Count Period Beginning At	Granite Dr (Northbound)				Granite Dr (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	1	1	0	13	0	2	0	3	36	0	0	1	23	37	0	117	
7:05 AM	1	3	0	0	16	1	5	0	5	39	1	0	2	20	24	0	117	
7:10 AM	0	0	0	0	13	0	2	0	4	37	0	1	3	27	27	0	114	
7:15 AM	1	1	1	0	15	1	2	0	8	51	0	0	0	29	24	0	133	
7:20 AM	0	0	1	0	10	0	4	0	5	44	1	1	0	37	40	0	143	
7:25 AM	0	2	0	0	22	0	3	0	6	61	0	0	2	37	36	0	169	
7:30 AM	0	2	0	0	10	0	8	0	7	82	0	0	0	30	33	0	172	
7:35 AM	0	0	0	0	16	0	5	0	2	69	1	1	0	39	44	0	177	
7:40 AM	0	1	1	0	15	0	6	0	4	54	0	0	0	28	42	0	151	
7:45 AM	0	2	0	0	3	1	8	0	15	74	1	0	0	50	43	0	197	
7:50 AM	2	1	0	0	27	1	3	0	8	62	0	0	1	46	49	0	200	
7:55 AM	2	0	0	0	20	1	8	0	13	44	2	1	3	70	56	0	220	1910
8:00 AM	0	0	0	0	23	0	8	0	9	73	0	1	3	77	53	0	247	2040
8:05 AM	3	4	2	0	21	3	2	1	12	66	3	0	3	52	42	0	214	2137
8:10 AM	1	1	1	0	21	0	12	0	19	61	3	2	2	74	44	0	241	2264
8:15 AM	1	3	2	0	39	1	11	0	8	57	0	1	2	37	42	0	204	2335
8:20 AM	1	1	0	0	32	2	12	0	7	55	1	3	1	53	36	1	205	2397
8:25 AM	2	1	0	0	29	2	7	0	17	52	2	2	1	48	41	0	204	2432
8:30 AM	2	2	1	0	20	2	3	0	12	57	0	0	1	31	27	0	158	2418
8:35 AM	0	1	2	0	29	3	11	0	5	30	0	0	2	44	34	0	161	2402
8:40 AM	0	1	0	0	44	3	8	0	8	42	0	0	0	35	28	0	169	2420
8:45 AM	1	4	0	0	42	0	6	0	5	50	1	0	1	20	28	0	158	2381
8:50 AM	0	3	1	0	21	0	3	0	14	42	0	0	1	26	53	1	165	2346
8:55 AM	0	0	0	0	12	0	3	0	1	22	0	0	1	35	44	0	118	2244

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	20	12	0	260	12	88	4	160	800	24	12	32	812	556	0	2808
Heavy Trucks	0	8	0		20	0	16		0	4	0		0	12	36		96
Pedestrians		0				8				12				0			20
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

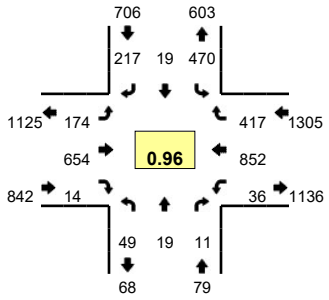
LOCATION: Granite Dr -- Rocklin Rd

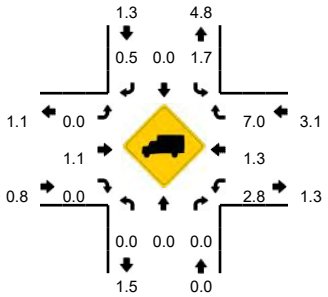
CITY/STATE: Placer, CA

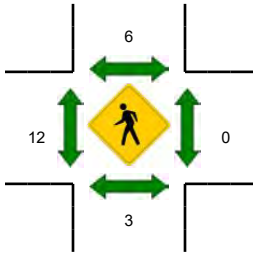
QC JOB #: 13963328

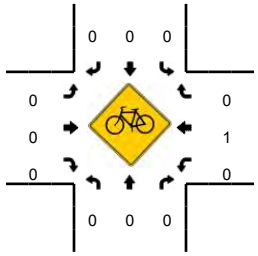
DATE: Thu, Nov 17 2016

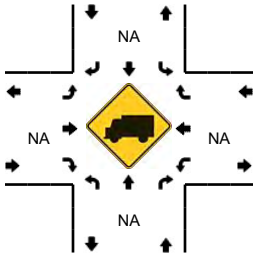
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

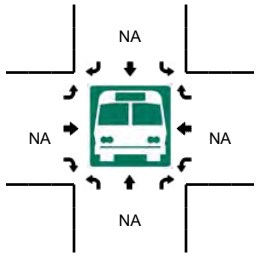












5-Min Count Period Beginning At	Granite Dr (Northbound)				Granite Dr (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	1	1	0	24	1	18	0	8	45	0	0	1	57	40	0	199	
4:05 PM	3	2	3	0	39	1	17	0	14	62	0	0	3	52	28	2	226	
4:10 PM	3	1	1	0	31	1	14	0	9	62	0	0	0	56	41	0	219	
4:15 PM	1	1	0	0	39	1	19	0	15	52	1	0	4	63	48	0	244	
4:20 PM	3	1	1	0	40	0	13	0	9	40	1	2	4	47	35	1	197	
4:25 PM	2	0	4	0	30	0	11	0	7	58	4	1	0	56	40	0	213	
4:30 PM	3	3	1	0	34	5	21	0	12	42	1	0	3	45	38	0	208	
4:35 PM	6	4	0	0	55	2	13	0	16	56	2	0	3	46	34	0	237	
4:40 PM	6	2	2	0	41	1	21	0	18	48	0	0	2	67	27	0	235	
4:45 PM	5	0	1	0	21	1	13	0	3	66	3	0	1	100	36	0	250	
4:50 PM	7	4	0	0	53	0	24	0	12	42	0	0	4	56	34	0	236	
4:55 PM	4	0	2	0	30	2	19	0	15	57	2	1	7	65	27	0	231	2695
5:00 PM	3	2	2	0	47	1	23	0	18	55	0	0	4	82	36	0	273	2769
5:05 PM	3	1	1	0	57	1	19	0	13	42	0	0	3	48	46	1	235	2778
5:10 PM	6	1	0	0	51	3	16	0	19	68	0	0	6	49	37	0	256	2815
5:15 PM	2	2	0	0	20	3	19	0	11	66	1	0	1	105	27	0	257	2828
5:20 PM	3	1	0	0	36	2	13	0	16	62	3	2	4	52	46	0	240	2871
5:25 PM	2	3	1	0	29	1	12	0	8	52	4	1	1	90	28	0	232	2890
5:30 PM	4	2	0	0	43	3	22	0	21	41	1	1	1	63	40	0	242	2924
5:35 PM	4	1	2	0	42	1	16	0	13	55	0	2	1	75	33	0	245	2932
5:40 PM	8	0	0	0	30	1	17	0	6	36	0	0	1	86	36	0	221	2918
5:45 PM	3	1	0	0	29	1	10	0	18	47	2	0	1	73	28	0	213	2881
5:50 PM	6	2	2	0	46	1	16	0	14	43	0	0	6	53	38	1	228	2873
5:55 PM	5	2	1	0	35	5	17	0	19	53	0	0	2	59	34	0	232	2874

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	16	12	0	620	20	232	0	200	660	0	0	52	716	476	4	3056
Heavy Trucks	0	0	0		24	0	0		0	4	0		0	8	44		80
Pedestrians		0				8				20				0			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

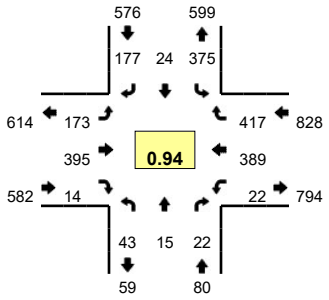
Type of peak hour being reported: Intersection Peak

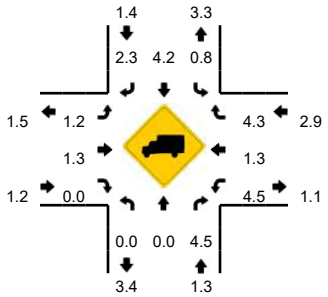
Method for determining peak hour: Total Entering Volume

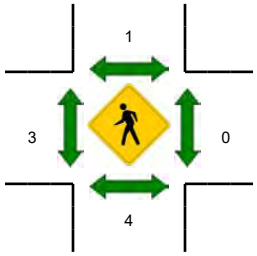
LOCATION: A9 - Granite†Dr -- Rocklin†Rd
CITY/STATE: Placer, CA

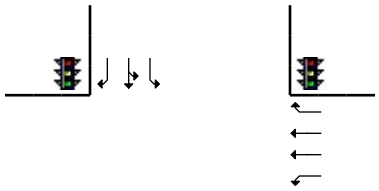
QC JOB #: 14088514
DATE: Sat, Jan 28 2017

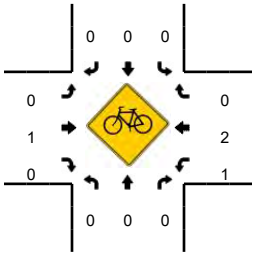
Peak-Hour: 11:50 AM -- 12:50 PM
Peak 15-Min: 12:35 PM -- 12:50 PM

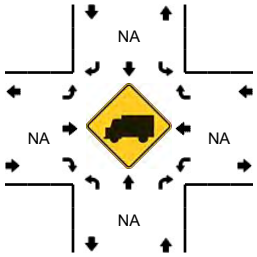


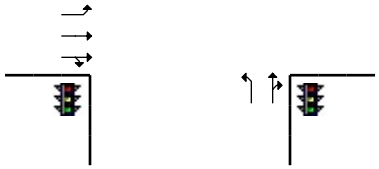


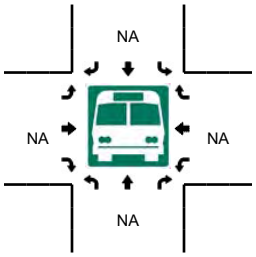












5-Min Count Period Beginning At	A9 - Granite†Dr (Northbound)				A9 - Granite†Dr (Southbound)				Rocklin†Rd (Eastbound)				Rocklin†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	2	2	4	0	24	1	10	0	15	28	1	2	3	48	26	0	166	
11:05 AM	2	1	2	0	26	2	15	0	7	38	1	1	3	43	34	0	175	
11:10 AM	2	1	1	0	39	1	12	0	21	28	1	0	2	28	37	1	174	
11:15 AM	1	0	1	0	24	1	6	0	11	38	3	0	3	33	30	0	151	
11:20 AM	2	1	0	0	25	1	13	0	3	40	0	0	3	24	37	0	149	
11:25 AM	3	1	2	0	15	1	15	0	14	32	1	1	2	30	36	1	154	
11:30 AM	3	2	1	0	24	3	14	0	18	32	1	0	4	30	42	0	174	
11:35 AM	3	2	2	0	42	0	19	0	13	37	4	1	2	33	33	0	191	
11:40 AM	3	1	1	0	45	3	16	0	14	31	0	0	3	24	25	0	166	
11:45 AM	3	3	0	0	28	2	16	0	0	48	2	2	2	23	45	0	174	
11:50 AM	3	0	2	0	18	1	12	0	18	25	2	2	0	37	40	0	160	
11:55 AM	4	2	2	0	29	1	18	0	17	33	3	0	1	35	45	0	190	2024
12:00 PM	3	0	4	0	33	2	21	0	11	36	0	0	2	36	39	1	188	2046
12:05 PM	4	2	2	0	33	3	14	0	15	38	2	0	0	27	25	1	166	2037
12:10 PM	2	2	0	0	21	1	15	0	14	36	1	1	1	33	31	0	158	2021
12:15 PM	5	1	4	1	40	1	17	0	8	35	1	1	1	30	23	0	168	2038
12:20 PM	4	1	1	0	21	2	13	0	16	38	2	1	0	26	35	0	160	2049
12:25 PM	1	2	1	0	33	3	16	0	9	23	1	0	3	33	31	0	156	2051
12:30 PM	5	1	2	0	46	4	13	0	8	27	1	0	4	18	41	0	170	2047
12:35 PM	3	0	3	0	34	3	12	0	17	38	0	0	3	41	33	0	187	2043
12:40 PM	5	2	0	0	36	1	13	0	16	37	1	0	1	43	30	0	185	2062
12:45 PM	3	2	1	0	31	2	13	0	18	29	0	1	4	30	44	0	178	2066
12:50 PM	3	1	2	0	37	2	15	0	8	25	2	1	2	29	30	0	157	2063
12:55 PM	3	1	2	0	27	3	18	0	18	41	2	1	2	33	39	0	190	2063

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	16	16	0	404	24	152	0	204	416	4	4	32	456	428	0	2200
Heavy Trucks	0	0	0		0	4	0		0	8	0		4	0	16		32
Pedestrians		12				0				4				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

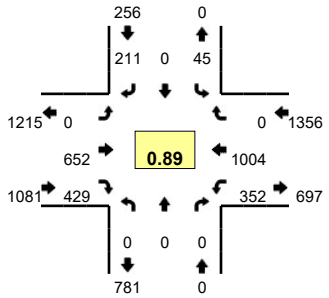
Type of peak hour being reported: Intersection Peak

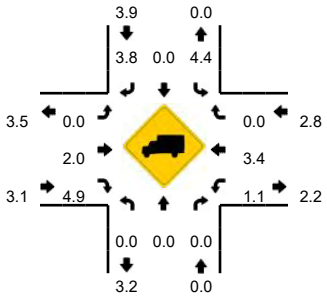
Method for determining peak hour: Total Entering Volume

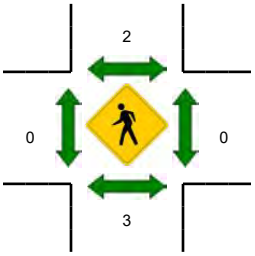
LOCATION: I-80 WB Ramps -- Rocklin Rd
CITY/STATE: Placer, CA

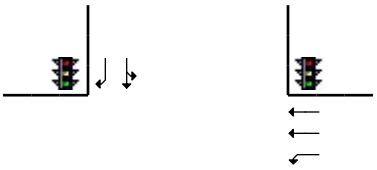
QC JOB #: 13963337
DATE: Thu, Nov 17 2016

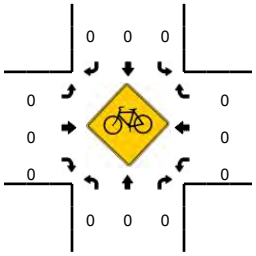
Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

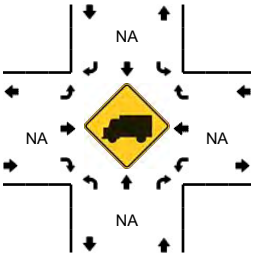


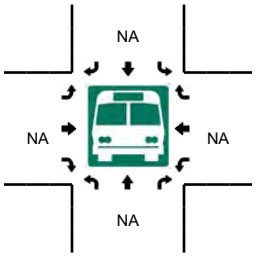












5-Min Count Period Beginning At	I-80 WB Ramps (Northbound)				I-80 WB Ramps (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	12	0	0	35	25	0	33	49	0	0	155	
7:05 AM	0	0	0	0	2	0	7	0	0	33	21	0	30	42	0	0	135	
7:10 AM	0	0	0	0	4	0	7	0	0	29	25	0	35	52	0	0	152	
7:15 AM	0	0	0	0	7	0	4	0	0	46	25	0	45	56	0	0	183	
7:20 AM	0	0	0	0	2	1	12	0	0	35	20	0	38	71	0	0	179	
7:25 AM	0	0	0	0	2	0	14	0	0	45	18	0	35	61	0	0	175	
7:30 AM	0	0	0	0	4	0	10	0	0	81	29	0	33	62	0	0	219	
7:35 AM	0	0	0	0	2	0	20	0	0	65	25	0	25	56	0	0	193	
7:40 AM	0	0	0	0	2	0	13	0	0	52	20	0	43	66	0	0	196	
7:45 AM	0	0	0	0	3	0	24	0	0	62	19	0	28	78	0	0	214	
7:50 AM	0	0	0	0	5	0	26	0	0	62	29	0	31	96	0	0	249	
7:55 AM	0	0	0	0	9	0	19	0	0	39	34	0	24	113	0	0	238	2288
8:00 AM	0	0	0	0	2	0	19	0	0	46	42	0	43	121	0	0	273	2406
8:05 AM	0	0	0	0	5	0	14	0	0	58	56	0	16	88	0	0	237	2508
8:10 AM	0	0	0	0	5	0	15	0	0	47	40	0	35	94	0	0	236	2592
8:15 AM	0	0	0	0	2	0	16	0	0	51	47	0	30	84	0	0	230	2639
8:20 AM	0	0	0	0	5	0	15	0	0	47	41	0	25	80	0	0	213	2673
8:25 AM	0	0	0	0	1	0	20	0	0	42	47	0	19	66	0	0	195	2693
8:30 AM	0	0	0	0	4	0	16	0	0	56	31	0	28	54	0	0	189	2663
8:35 AM	0	0	0	0	1	0	15	0	0	31	28	0	35	59	0	0	169	2639
8:40 AM	0	0	0	0	2	0	13	0	0	55	38	0	26	51	0	0	185	2628
8:45 AM	0	0	0	0	8	0	14	0	0	48	48	0	32	46	0	0	196	2610
8:50 AM	0	0	0	0	5	0	16	0	0	35	41	0	39	73	0	0	209	2570
8:55 AM	0	0	0	0	2	0	8	0	0	45	33	0	28	80	0	0	196	2528

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	64	0	256	0	0	588	420	0	392	1320	0	0	3040
Heavy Trucks	0	0	0		4	0	8		0	16	16		4	40	0		88
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

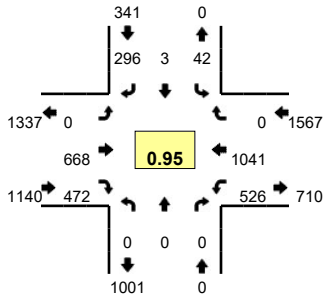
Type of peak hour being reported: Intersection Peak

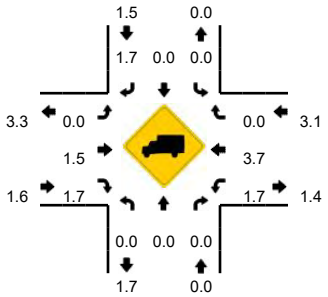
Method for determining peak hour: Total Entering Volume

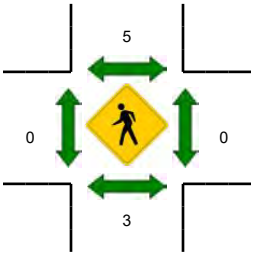
LOCATION: I-80 WB Ramps -- Rocklin Rd
CITY/STATE: Placer, CA

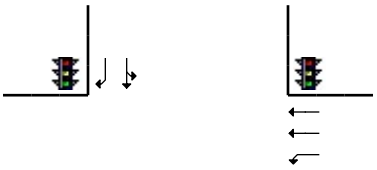
QC JOB #: 13963338
DATE: Thu, Nov 17 2016

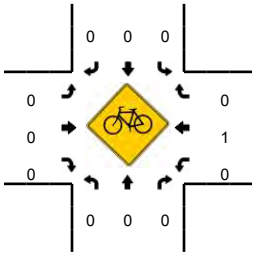
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

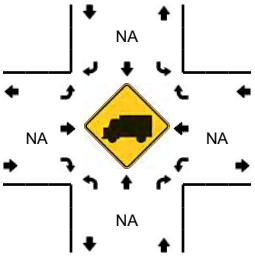


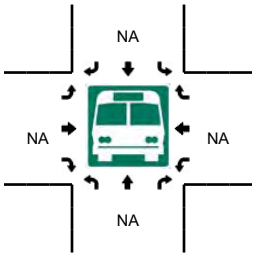












5-Min Count Period Beginning At	I-80 WB Ramps (Northbound)				I-80 WB Ramps (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	3	0	20	0	0	37	30	0	56	89	0	0	235	
4:05 PM	0	0	0	0	2	0	15	0	0	54	48	0	42	87	0	0	248	
4:10 PM	0	0	0	0	0	0	22	0	0	60	29	0	58	63	0	0	232	
4:15 PM	0	0	0	0	4	0	14	0	0	69	50	0	45	104	0	0	286	
4:20 PM	0	0	0	0	7	0	17	0	0	55	32	0	37	84	0	0	232	
4:25 PM	0	0	0	0	3	1	20	0	0	56	28	0	40	68	0	0	216	
4:30 PM	0	0	0	0	3	0	14	0	0	49	29	0	34	81	0	0	210	
4:35 PM	0	0	0	0	2	0	19	0	0	57	39	0	40	72	0	0	229	
4:40 PM	0	0	0	0	7	0	36	0	0	45	44	0	48	82	0	0	262	
4:45 PM	0	0	0	0	4	2	24	0	0	52	28	0	53	92	0	0	255	
4:50 PM	0	0	0	0	5	0	20	0	0	74	41	0	29	98	0	0	267	
4:55 PM	0	0	0	0	0	0	21	0	0	62	30	0	64	83	0	0	260	2932
5:00 PM	0	0	0	0	2	0	22	0	0	47	48	0	52	107	0	0	278	2975
5:05 PM	0	0	0	0	1	1	19	0	0	53	47	0	47	77	0	0	245	2972
5:10 PM	0	0	0	0	3	0	16	0	0	59	46	0	54	101	0	0	279	3019
5:15 PM	0	0	0	0	0	0	26	0	0	61	42	0	51	83	0	0	263	2996
5:20 PM	0	0	0	0	9	0	35	0	0	72	27	0	32	86	0	0	261	3025
5:25 PM	0	0	0	0	5	0	25	0	0	51	40	0	30	76	0	0	227	3036
5:30 PM	0	0	0	0	4	0	25	0	0	38	35	0	31	69	0	0	202	3028
5:35 PM	0	0	0	0	2	0	27	0	0	54	44	0	35	87	0	0	249	3048
5:40 PM	0	0	0	0	3	0	22	0	0	43	25	0	37	97	0	0	227	3013
5:45 PM	0	0	0	0	4	0	27	0	0	49	34	0	27	78	0	0	219	2977
5:50 PM	0	0	0	0	5	0	17	0	0	55	37	0	25	94	0	0	233	2943
5:55 PM	0	0	0	0	5	1	19	0	0	65	31	0	24	86	0	0	231	2914

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	28	0	252	0	0	732	476	0	580	1152	0	0	3220
Heavy Trucks	0	0	0		0	0	0		0	12	12		8	52	0		84
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

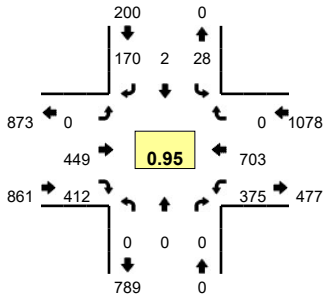
Type of peak hour being reported: Intersection Peak

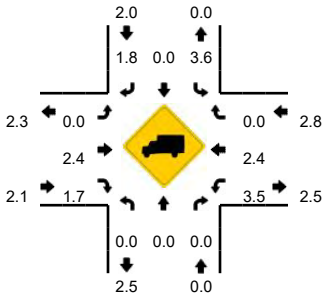
Method for determining peak hour: Total Entering Volume

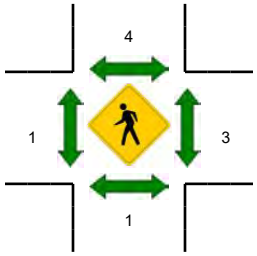
LOCATION: A8 - I-80†WB†Ramps -- Rocklin Rd
CITY/STATE: Placer, CA

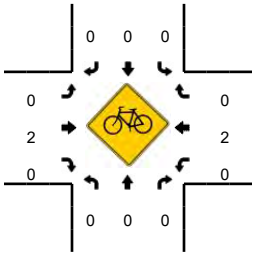
QC JOB #: 14088519
DATE: Sat, Jan 28 2017

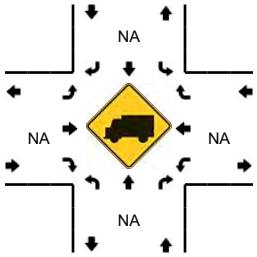
Peak-Hour: 11:40 AM -- 12:40 PM
Peak 15-Min: 11:55 AM -- 12:10 PM

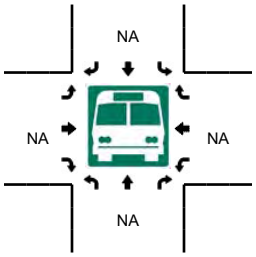












5-Min Count Period Beginning At	A8 - I-80†WB†Ramps (Northbound)				A8 - I-80†WB†Ramps (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	1	0	16	0	0	34	31	0	24	64	0	0	170	
11:05 AM	0	0	0	0	5	0	17	0	0	26	40	0	29	66	0	0	183	
11:10 AM	0	0	0	0	0	0	21	0	1	39	33	0	28	63	0	0	185	
11:15 AM	0	0	0	0	0	0	15	0	0	42	31	0	23	46	0	0	157	
11:20 AM	0	0	0	0	1	0	9	0	0	43	29	0	28	58	0	0	168	
11:25 AM	0	0	0	0	1	0	8	0	0	24	26	0	27	61	0	0	147	
11:30 AM	0	0	0	0	1	0	9	0	0	37	29	0	20	71	0	0	167	
11:35 AM	0	0	0	0	2	0	15	0	0	44	34	0	26	61	0	0	182	
11:40 AM	0	0	0	0	3	0	18	0	0	40	44	0	24	50	0	0	179	
11:45 AM	0	0	0	0	0	0	8	0	0	43	36	0	49	67	0	0	203	
11:50 AM	0	0	0	0	2	1	17	0	0	31	23	0	31	62	0	0	167	
11:55 AM	0	0	0	0	1	0	29	0	0	32	26	0	39	57	0	0	184	2092
12:00 PM	0	0	0	0	2	0	16	0	0	44	34	0	23	65	0	0	184	2106
12:05 PM	0	0	0	0	3	0	14	0	0	44	43	0	38	50	0	0	192	2115
12:10 PM	0	0	0	0	6	1	13	0	0	36	29	0	24	49	0	0	158	2088
12:15 PM	0	0	0	0	0	0	12	0	0	45	37	0	20	50	0	0	164	2095
12:20 PM	0	0	0	0	2	0	6	0	0	28	29	0	38	64	0	0	167	2094
12:25 PM	0	0	0	0	5	0	11	0	0	27	25	0	26	61	0	0	155	2102
12:30 PM	0	0	0	0	2	0	11	0	0	33	45	0	37	59	0	0	187	2122
12:35 PM	0	0	0	0	2	0	15	0	0	46	41	0	26	69	0	0	199	2139
12:40 PM	0	0	0	0	2	0	19	0	0	44	35	0	18	57	0	0	175	2135
12:45 PM	0	0	0	0	6	0	15	0	0	40	29	0	35	82	0	0	207	2139
12:50 PM	0	0	0	0	4	1	13	0	0	40	30	0	14	63	0	0	165	2137
12:55 PM	0	0	0	0	1	0	15	0	0	39	30	0	24	64	0	0	173	2126

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	24	0	236	0	0	480	412	0	400	688	0	0	2240
Heavy Trucks	0	0	0		0	0	0		0	4	16		16	32	0		68
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

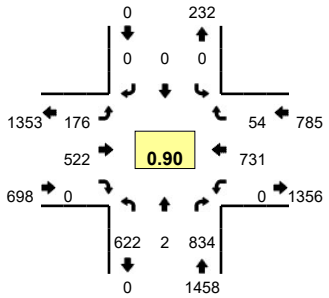
Type of peak hour being reported: Intersection Peak

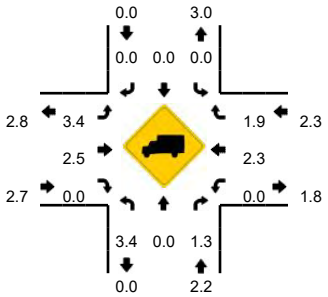
Method for determining peak hour: Total Entering Volume

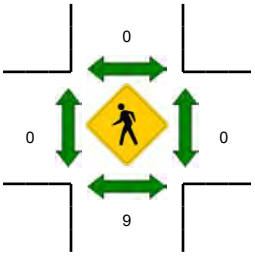
LOCATION: I-80 EB Ramps -- Rocklin Rd
CITY/STATE: Placer, CA

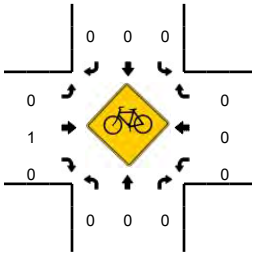
QC JOB #: 13963339
DATE: Thu, Nov 17 2016

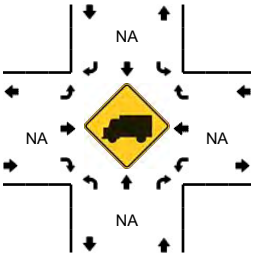
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

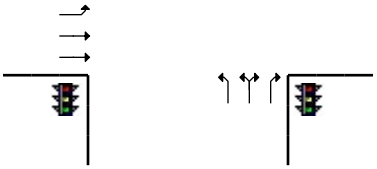


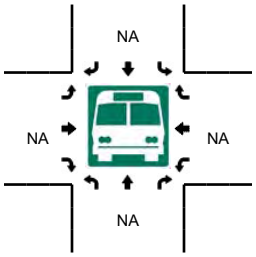












5-Min Count Period Beginning At	I-80 EB Ramps (Northbound)				I-80 EB Ramps (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	32	0	31	0	0	0	0	0	12	23	0	0	0	48	1	0	147	
7:05 AM	34	0	37	0	0	0	0	0	9	21	0	0	0	39	2	0	142	
7:10 AM	35	0	41	0	0	0	0	0	14	26	0	0	0	55	4	0	175	
7:15 AM	41	0	45	0	0	0	0	0	17	31	0	0	0	64	2	0	200	
7:20 AM	44	0	61	0	0	0	0	0	11	33	0	0	0	58	6	0	213	
7:25 AM	36	0	71	0	0	0	0	0	16	34	0	0	0	61	6	0	224	
7:30 AM	47	0	74	0	0	0	0	0	22	51	0	0	0	51	10	0	255	
7:35 AM	37	0	76	0	0	0	0	0	16	60	0	0	0	50	3	0	242	
7:40 AM	54	0	108	0	0	0	0	0	19	33	0	0	0	51	3	0	268	
7:45 AM	49	0	89	0	0	0	0	0	13	61	0	0	0	57	3	0	272	
7:50 AM	60	0	87	0	0	0	0	0	13	53	0	0	0	63	4	0	280	
7:55 AM	83	0	73	0	0	0	0	0	10	34	0	0	0	52	2	0	254	2672
8:00 AM	51	0	53	0	0	0	0	0	8	45	0	0	0	108	3	0	268	2793
8:05 AM	57	1	54	0	0	0	0	0	21	34	0	0	0	48	3	0	218	2869
8:10 AM	56	0	40	0	0	0	0	0	14	49	0	0	0	65	7	0	231	2925
8:15 AM	48	1	48	0	0	0	0	0	13	35	0	0	0	67	4	0	216	2941
8:20 AM	51	0	42	0	0	0	0	0	12	40	0	0	0	50	6	0	201	2929
8:25 AM	42	0	40	0	0	0	0	0	18	24	0	0	0	43	3	0	170	2875
8:30 AM	35	0	41	0	0	0	0	0	14	43	0	0	0	45	4	0	182	2802
8:35 AM	33	0	42	0	0	0	0	0	10	28	0	0	0	61	4	0	178	2738
8:40 AM	31	1	50	0	0	0	0	0	11	31	0	0	0	49	4	0	177	2647
8:45 AM	29	1	53	0	0	0	0	0	16	56	0	0	0	46	2	0	203	2578
8:50 AM	50	0	52	0	0	0	0	0	4	34	0	0	0	63	8	0	211	2509
8:55 AM	65	0	57	0	0	0	0	0	7	31	0	0	0	48	5	0	213	2468

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	652	0	1136	0	0	0	0	0	180	588	0	0	0	684	40	0	3280
Heavy Trucks	20	0	8		0	0	0		12	4	0		0	8	0		52
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

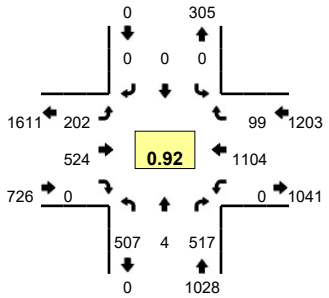
Type of peak hour being reported: Intersection Peak

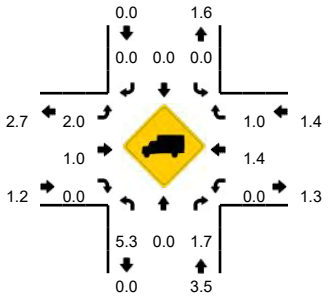
Method for determining peak hour: Total Entering Volume

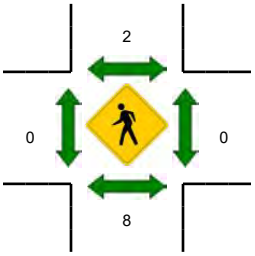
LOCATION: I-80 EB Ramps -- Rocklin Rd
CITY/STATE: Placer, CA

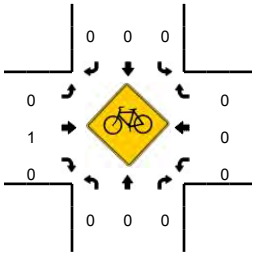
QC JOB #: 13963340
DATE: Thu, Nov 17 2016

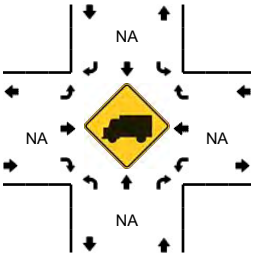
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

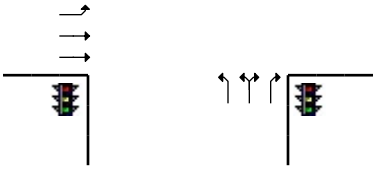


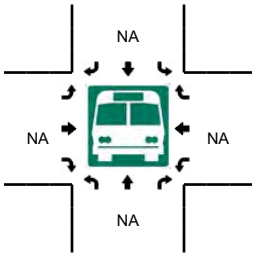












5-Min Count Period Beginning At	I-80 EB Ramps (Northbound)				I-80 EB Ramps (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	40	0	43	0	0	0	0	0	13	43	0	0	0	101	7	0	247	
4:05 PM	46	0	40	0	0	0	0	0	19	39	0	0	0	79	5	0	228	
4:10 PM	31	0	40	0	0	0	0	0	13	42	0	0	0	81	9	0	216	
4:15 PM	56	0	55	0	0	0	0	0	17	42	0	0	0	107	8	0	285	
4:20 PM	44	1	44	0	0	0	0	0	20	44	0	0	0	67	8	0	228	
4:25 PM	36	0	43	0	0	0	0	0	31	40	0	0	0	66	6	0	222	
4:30 PM	36	0	37	0	0	0	0	0	17	43	0	0	0	81	6	0	220	
4:35 PM	32	2	40	0	0	0	0	0	11	45	0	0	0	81	4	0	215	
4:40 PM	44	0	43	0	0	0	0	0	14	41	0	0	0	86	6	0	234	
4:45 PM	44	0	42	0	0	0	0	0	7	44	0	0	0	99	9	0	245	
4:50 PM	56	0	42	0	0	0	0	0	22	48	0	0	0	88	15	0	271	
4:55 PM	36	0	41	0	0	0	0	0	17	37	0	0	0	93	8	0	232	2843
5:00 PM	40	0	50	0	0	0	0	0	20	53	0	0	0	116	8	0	287	2883
5:05 PM	40	1	40	0	0	0	0	0	16	40	0	0	0	104	10	0	251	2906
5:10 PM	43	0	40	0	0	0	0	0	10	47	0	0	0	116	11	0	267	2957
5:15 PM	34	0	48	0	0	0	0	0	21	43	0	0	0	86	7	0	239	2911
5:20 PM	52	1	50	0	0	0	0	0	18	54	0	0	0	68	6	0	249	2932
5:25 PM	31	0	35	0	0	0	0	0	23	39	0	0	0	82	6	0	216	2926
5:30 PM	43	0	41	0	0	0	0	0	16	34	0	0	0	83	8	0	225	2931
5:35 PM	51	0	49	0	0	0	0	0	25	44	0	0	0	65	6	0	240	2956
5:40 PM	51	0	48	0	0	0	0	0	7	40	0	0	0	75	5	0	226	2948
5:45 PM	41	0	50	0	0	0	0	0	10	31	0	0	0	70	6	0	208	2911
5:50 PM	54	0	65	0	0	0	0	0	12	45	0	0	0	69	4	0	249	2889
5:55 PM	48	0	49	0	0	0	0	0	18	55	0	0	0	56	5	0	231	2888

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	492	4	520	0	0	0	0	0	184	560	0	0	0	1344	116	0	3220
Heavy Trucks	48	0	12		0	0	0		0	8	0		0	16	0		84
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

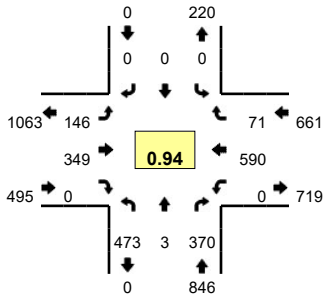
Type of peak hour being reported: Intersection Peak

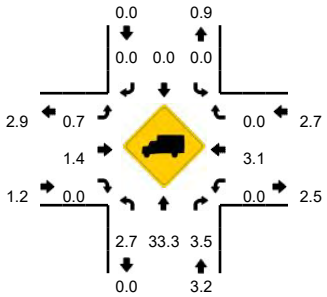
Method for determining peak hour: Total Entering Volume

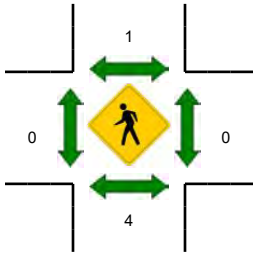
LOCATION: A7 - I-80†EB†Ramps -- Rocklin Rd
CITY/STATE: Placer, CA

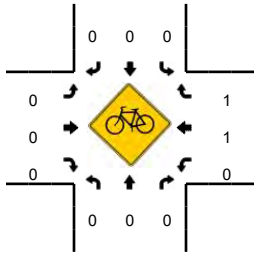
QC JOB #: 14088520
DATE: Sat, Jan 28 2017

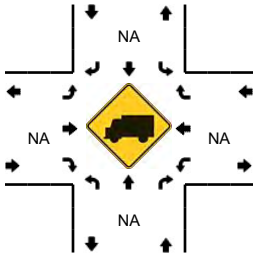
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:35 PM -- 12:50 PM

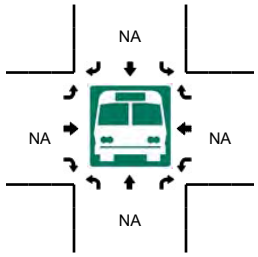












5-Min Count Period Beginning At	A7 - I-80†EB†Ramps (Northbound)				A7 - I-80†EB†Ramps (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	31	0	28	0	0	0	0	0	12	20	0	0	0	56	6	0	153	
11:05 AM	43	0	24	0	0	0	0	0	12	20	0	0	0	59	4	0	162	
11:10 AM	36	0	12	0	0	0	0	0	8	31	0	0	0	53	7	0	147	
11:15 AM	32	0	23	0	0	0	0	0	7	29	0	0	0	45	6	0	142	
11:20 AM	39	1	34	0	0	0	0	0	17	32	0	0	0	38	6	0	167	
11:25 AM	42	0	26	0	0	0	0	0	10	15	0	0	0	54	5	0	152	
11:30 AM	40	0	28	0	0	0	0	0	14	27	0	0	0	44	5	0	158	
11:35 AM	42	0	28	0	0	0	0	0	17	30	0	0	0	44	7	0	168	
11:40 AM	31	0	36	0	0	0	0	0	14	30	0	0	0	50	11	0	172	
11:45 AM	38	1	24	0	0	0	0	0	18	25	0	0	0	65	5	0	176	
11:50 AM	40	0	37	0	0	0	0	0	10	21	0	0	0	58	6	0	172	
11:55 AM	31	1	23	0	0	0	0	0	7	28	0	0	0	62	7	0	159	1928
12:00 PM	38	1	32	0	0	0	0	0	16	31	0	0	0	47	8	0	173	1948
12:05 PM	28	0	26	0	0	0	0	0	9	38	0	0	0	57	7	0	165	1951
12:10 PM	30	0	30	0	0	0	0	0	12	30	0	0	0	46	6	0	154	1958
12:15 PM	38	1	22	0	0	0	0	0	9	27	0	0	0	43	5	0	145	1961
12:20 PM	33	0	28	0	0	0	0	0	16	22	0	0	0	62	4	0	165	1959
12:25 PM	42	0	34	0	0	0	0	0	13	20	0	0	0	42	4	0	155	1962
12:30 PM	40	0	29	0	0	0	0	0	12	24	0	0	0	52	6	0	163	1967
12:35 PM	42	0	35	0	0	0	0	0	15	33	0	0	0	54	3	0	182	1981
12:40 PM	42	0	31	0	0	0	0	0	16	30	0	0	0	57	5	0	181	1990
12:45 PM	42	1	28	0	0	0	0	0	7	33	0	0	0	48	10	0	169	1983
12:50 PM	46	0	37	0	0	0	0	0	11	31	0	0	0	44	6	0	175	1986
12:55 PM	52	0	38	0	0	0	0	0	10	30	0	0	0	38	7	0	175	2002

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	504	4	376	0	0	0	0	0	152	384	0	0	0	636	72	0	2128
Heavy Trucks	8	4	8		0	0	0		0	8	0		0	12	0		40
Pedestrians		4				4				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

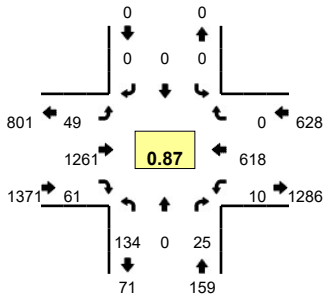
Type of peak hour being reported: Intersection Peak

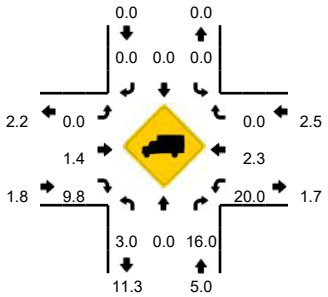
Method for determining peak hour: Total Entering Volume

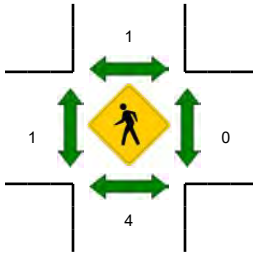
LOCATION: Aguilar Rd -- Rocklin Rd
CITY/STATE: Placer, CA

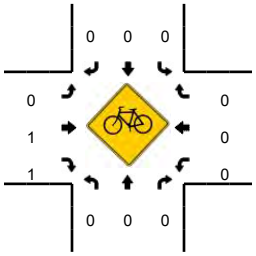
QC JOB #: 13963325
DATE: Thu, Nov 17 2016

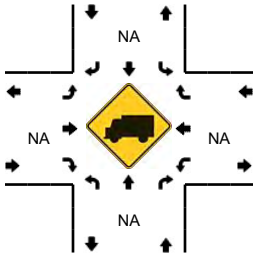
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

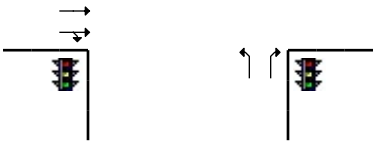


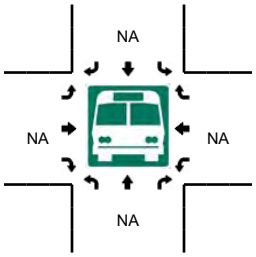












5-Min Count Period Beginning At	Aguilar Rd (Northbound)				Aguilar Rd (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	0	1	0	0	0	0	0	0	54	1	4	1	34	0	0	101	
7:05 AM	6	0	1	0	0	0	0	0	0	56	0	3	0	37	0	0	103	
7:10 AM	14	0	2	0	0	0	0	0	0	63	3	2	0	47	0	0	131	
7:15 AM	14	0	1	0	0	0	0	0	0	65	4	2	1	50	0	0	137	
7:20 AM	23	0	1	0	0	0	0	0	0	80	4	4	0	42	0	0	154	
7:25 AM	12	0	2	0	0	0	0	0	0	103	3	4	0	39	0	0	163	
7:30 AM	12	0	0	0	0	0	0	0	0	112	4	2	0	52	0	0	182	
7:35 AM	10	0	9	0	0	0	0	0	0	132	2	2	3	38	0	0	196	
7:40 AM	13	0	2	0	0	0	0	0	0	136	6	7	0	34	0	0	198	
7:45 AM	4	0	0	0	0	0	0	0	0	144	3	5	0	56	0	0	212	
7:50 AM	9	0	2	0	0	0	0	0	0	146	3	3	1	46	0	0	210	
7:55 AM	6	0	3	0	0	0	0	0	0	87	8	2	0	57	0	0	163	1950
8:00 AM	10	0	1	0	0	0	0	0	0	93	10	3	3	95	0	0	215	2064
8:05 AM	10	0	1	0	0	0	0	0	0	71	9	4	1	46	0	0	142	2103
8:10 AM	11	0	4	0	0	0	0	0	0	85	7	3	1	61	0	0	172	2144
8:15 AM	14	0	0	0	0	0	0	0	0	72	2	10	1	52	0	0	151	2158
8:20 AM	7	0	2	0	0	0	0	0	0	75	6	7	1	51	0	0	149	2153
8:25 AM	8	0	4	0	0	0	0	0	0	59	7	3	1	30	0	0	112	2102
8:30 AM	7	0	1	0	0	0	0	0	0	70	8	2	2	43	0	0	133	2053
8:35 AM	8	0	4	0	0	0	0	0	0	61	7	5	1	52	0	0	138	1995
8:40 AM	6	0	1	0	0	0	0	0	0	70	5	4	1	46	0	0	133	1930
8:45 AM	6	0	2	0	0	0	0	0	0	94	6	5	1	36	0	0	150	1868
8:50 AM	8	0	2	0	0	0	0	0	0	94	2	2	0	59	0	0	167	1825
8:55 AM	9	0	2	0	0	0	0	0	0	87	2	5	0	48	0	0	153	1815

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	0	16	0	0	0	0	0	0	1704	48	60	4	544	0	0	2480
Heavy Trucks	0	0	0		0	0	0		0	8	8		0	12	0		28
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

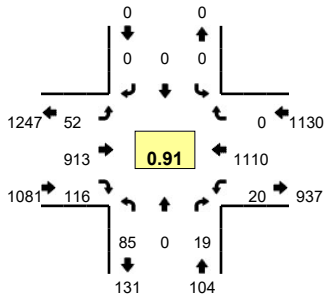
Type of peak hour being reported: Intersection Peak

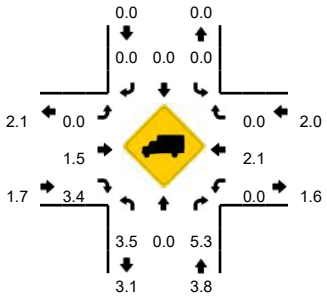
Method for determining peak hour: Total Entering Volume

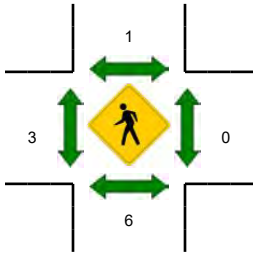
LOCATION: Aguilar Rd -- Rocklin Rd
CITY/STATE: Placer, CA

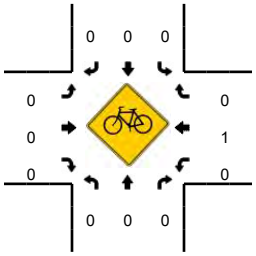
QC JOB #: 13963326
DATE: Thu, Nov 17 2016

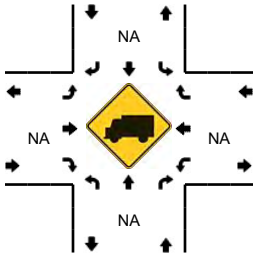
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

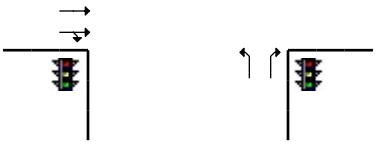


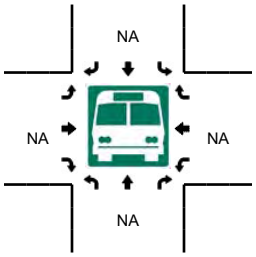












5-Min Count Period Beginning At	Aguilar Rd (Northbound)				Aguilar Rd (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	11	0	2	0	0	0	0	0	0	79	10	2	1	87	0	1	193	
4:05 PM	10	0	3	0	0	0	0	0	0	71	7	3	1	84	0	1	180	
4:10 PM	5	0	2	0	0	0	0	0	0	64	11	6	0	77	0	0	165	
4:15 PM	7	0	1	0	0	0	0	0	0	90	10	8	1	99	0	1	217	
4:20 PM	6	0	0	0	0	0	0	0	0	70	9	7	0	76	0	1	169	
4:25 PM	6	0	1	0	0	0	0	0	0	75	10	5	0	56	0	0	153	
4:30 PM	3	0	0	0	0	0	0	0	0	69	12	5	0	92	0	0	181	
4:35 PM	8	0	1	0	0	0	0	0	0	81	6	5	1	66	0	0	168	
4:40 PM	4	0	1	0	0	0	0	0	0	79	10	3	0	93	0	0	190	
4:45 PM	11	0	3	0	0	0	0	0	0	79	7	1	1	88	0	0	190	
4:50 PM	3	0	0	0	0	0	0	0	0	81	7	7	2	102	0	0	202	
4:55 PM	9	0	0	0	0	0	0	0	0	79	8	6	0	100	0	0	202	2210
5:00 PM	5	0	3	0	0	0	0	0	0	83	17	2	1	123	0	1	235	2252
5:05 PM	7	0	1	0	0	0	0	0	0	66	7	4	1	84	0	1	171	2243
5:10 PM	11	0	3	0	0	0	0	0	0	80	8	4	0	123	0	0	229	2307
5:15 PM	9	0	2	0	0	0	0	0	0	71	9	1	6	85	0	1	184	2274
5:20 PM	7	0	4	0	0	0	0	0	0	82	15	5	1	65	0	2	181	2286
5:25 PM	8	0	1	0	0	0	0	0	0	63	10	9	2	89	0	0	182	2315
5:30 PM	7	0	0	0	0	0	0	0	0	58	11	5	3	61	0	0	145	2279
5:35 PM	5	0	1	0	0	0	0	0	0	87	10	5	2	81	0	0	191	2302
5:40 PM	12	0	2	0	0	0	0	0	0	80	12	5	3	51	0	0	165	2277
5:45 PM	7	0	1	0	0	0	0	0	0	68	6	4	1	77	0	0	164	2251
5:50 PM	8	0	1	0	0	0	0	0	0	96	7	3	1	63	0	0	179	2228
5:55 PM	3	0	4	0	0	0	0	0	0	85	20	2	1	61	0	0	176	2202

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	68	0	12	0	0	0	0	0	0	972	128	60	12	1300	0	4	2556
Heavy Trucks	4	0	4		0	0	0		0	12	4		0	28	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

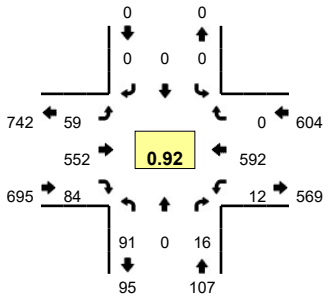
Type of peak hour being reported: Intersection Peak

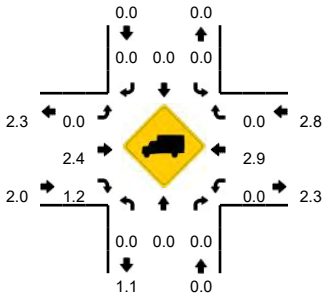
Method for determining peak hour: Total Entering Volume

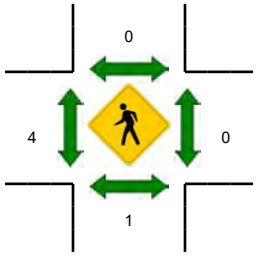
LOCATION: A6 - Aguilar†Rd -- Rocklin†Rd
CITY/STATE: Placer, CA

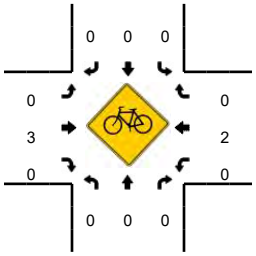
QC JOB #: 14088513
DATE: Sat, Jan 28 2017

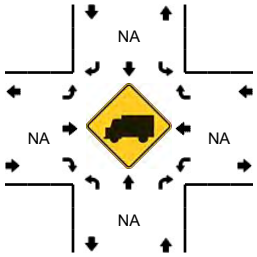
Peak-Hour: 11:35 AM -- 12:35 PM
Peak 15-Min: 11:35 AM -- 11:50 AM

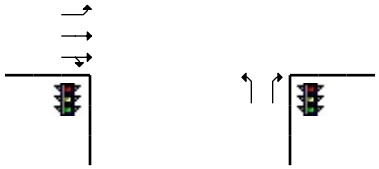


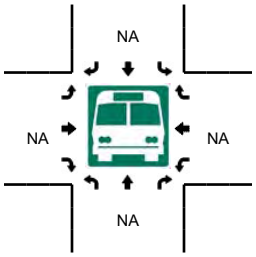












5-Min Count Period Beginning At	A6 - Aguilar†Rd (Northbound)				A6 - Aguilar†Rd (Southbound)				Rocklin†Rd (Eastbound)				Rocklin†Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	2	0	1	0	0	0	0	0	0	43	8	6	2	57	0	0	119	
11:05 AM	12	0	1	0	0	0	0	0	0	29	10	8	0	45	0	0	105	
11:10 AM	8	0	2	0	0	0	0	0	0	35	4	6	0	44	0	0	99	
11:15 AM	4	0	1	0	0	0	0	0	0	41	6	6	1	45	0	0	104	
11:20 AM	6	0	0	0	0	0	0	0	0	48	13	8	1	34	0	0	110	
11:25 AM	10	0	1	0	0	0	0	0	0	34	4	2	0	47	0	0	98	
11:30 AM	5	0	2	0	0	0	0	0	0	41	5	8	0	38	0	0	99	
11:35 AM	11	0	0	0	0	0	0	0	0	54	5	5	1	51	0	0	127	
11:40 AM	4	0	2	0	0	0	0	0	0	49	5	4	1	55	0	0	120	
11:45 AM	8	0	1	0	0	0	0	0	0	50	7	8	0	60	0	0	134	
11:50 AM	5	0	1	0	0	0	0	0	0	45	7	6	0	47	0	0	111	
11:55 AM	8	0	2	0	0	0	0	0	0	42	6	5	2	51	0	0	116	1342
12:00 PM	7	0	0	0	0	0	0	0	0	46	9	7	1	45	0	0	115	1338
12:05 PM	9	0	2	0	0	0	0	0	0	50	14	6	1	52	0	0	134	1367
12:10 PM	5	0	3	0	0	0	0	0	0	54	8	2	1	42	0	1	116	1384
12:15 PM	11	0	2	0	0	0	0	0	0	42	4	2	0	40	0	0	101	1381
12:20 PM	7	0	3	0	0	0	0	0	0	45	2	2	2	58	0	0	119	1390
12:25 PM	11	0	0	0	0	0	0	0	0	41	6	4	2	45	0	0	109	1401
12:30 PM	5	0	0	0	0	0	0	0	0	34	11	8	0	46	0	0	104	1406
12:35 PM	6	0	1	0	0	0	0	0	0	59	6	3	0	37	0	0	112	1391
12:40 PM	5	0	1	0	0	0	0	0	0	53	10	4	2	56	0	0	131	1402
12:45 PM	11	0	2	0	0	0	0	0	0	42	9	6	3	48	0	0	121	1389
12:50 PM	7	0	1	0	0	0	0	0	0	55	10	10	1	26	0	0	110	1388
12:55 PM	7	0	0	0	0	0	0	0	0	56	5	6	1	43	0	0	118	1390

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	92	0	12	0	0	0	0	0	0	612	68	68	8	664	0	0	1524
Heavy Trucks	0	0	0		0	0	0		0	16	0		0	16	0		32
Pedestrians		0				0				12				0			12
Bicycles	0	0	0		0	0	0		0	1	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

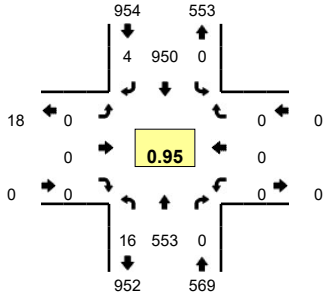
Type of peak hour being reported: Intersection Peak

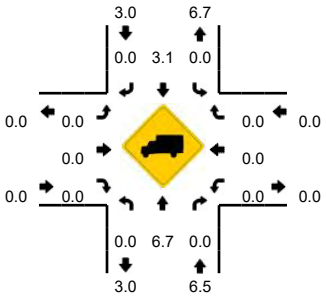
Method for determining peak hour: Total Entering Volume

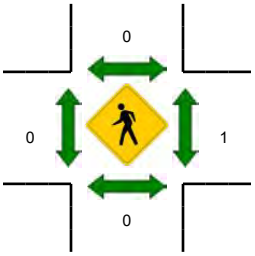
LOCATION: Sierra College Blvd -- Dwy S of Brace Rd
CITY/STATE: Rocklin, CA

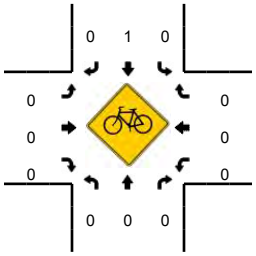
QC JOB #: 13963341
DATE: Thu, Nov 17 2016

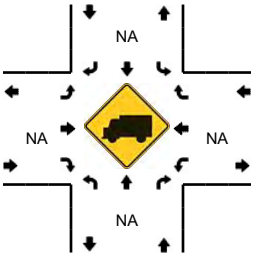
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

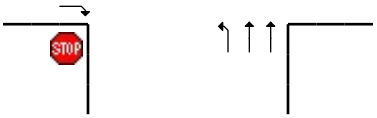


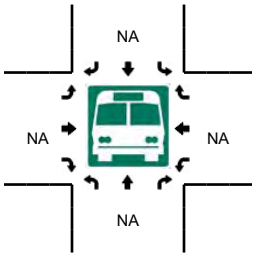












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Dwy S of Brace Rd (Eastbound)				Dwy S of Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	33	0	0	0	49	0	0	0	0	0	0	0	0	0	0	83	
7:05 AM	0	34	0	0	0	50	0	0	0	0	0	0	0	0	0	0	84	
7:10 AM	0	43	0	0	0	73	0	0	0	0	0	0	0	0	0	0	116	
7:15 AM	1	35	0	0	0	73	0	0	0	0	0	0	0	0	0	0	109	
7:20 AM	0	42	0	0	0	51	0	0	0	0	0	0	0	0	0	0	93	
7:25 AM	0	36	0	0	0	45	0	0	0	0	0	0	0	0	0	0	81	
7:30 AM	0	50	0	0	0	79	0	0	0	0	0	0	0	0	0	0	129	
7:35 AM	2	41	0	0	0	68	1	0	0	0	0	0	0	0	0	0	112	
7:40 AM	0	48	0	0	0	72	0	0	0	0	0	0	0	0	0	0	120	
7:45 AM	3	46	0	0	0	92	0	0	0	0	0	0	0	0	0	0	141	
7:50 AM	0	40	0	0	0	87	0	0	0	0	0	0	0	0	0	0	127	
7:55 AM	0	48	0	0	0	61	0	0	0	0	0	0	0	0	0	0	109	1304
8:00 AM	0	52	0	1	0	85	0	0	0	0	0	0	0	0	0	0	138	1359
8:05 AM	0	54	0	0	0	82	0	0	0	0	0	0	0	0	0	0	136	1411
8:10 AM	2	43	0	1	0	79	0	0	0	0	0	0	0	0	0	0	125	1420
8:15 AM	1	47	0	0	0	79	2	0	0	0	0	0	0	0	0	0	129	1440
8:20 AM	0	45	0	0	0	66	0	0	0	0	0	0	0	0	0	0	111	1458
8:25 AM	1	37	0	0	0	89	0	0	0	0	0	0	0	0	0	0	127	1504
8:30 AM	6	43	0	0	0	75	1	0	0	0	0	0	0	0	0	0	125	1500
8:35 AM	1	50	0	0	0	83	1	0	0	0	0	0	0	0	0	0	135	1523
8:40 AM	0	38	0	0	0	53	0	0	0	0	0	0	0	0	0	0	91	1494
8:45 AM	2	39	0	0	0	48	1	0	0	0	0	0	0	0	0	0	90	1443
8:50 AM	1	38	0	0	0	79	0	0	0	0	0	0	0	0	0	0	118	1434
8:55 AM	5	41	0	0	0	54	1	0	0	0	0	0	0	0	0	0	101	1426

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	596	0	8	0	984	0	0	0	0	0	0	0	0	0	0	1596
Heavy Trucks	0	44	0		0	44	0		0	0	0		0	0	0		88
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

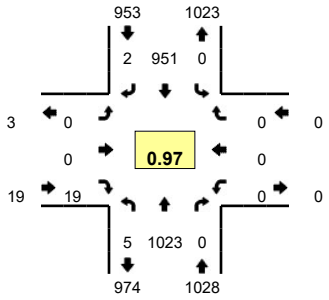
Type of peak hour being reported: Intersection Peak

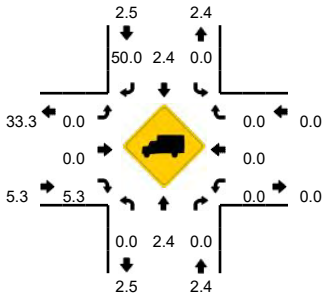
Method for determining peak hour: Total Entering Volume

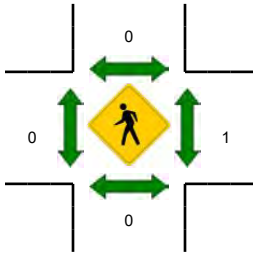
LOCATION: Sierra College Blvd -- Dwy S of Brace Rd
CITY/STATE: Rocklin, CA

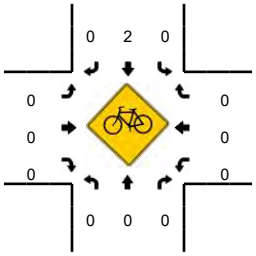
QC JOB #: 13963342
DATE: Thu, Nov 17 2016

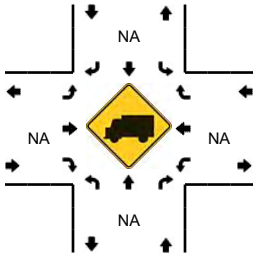
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

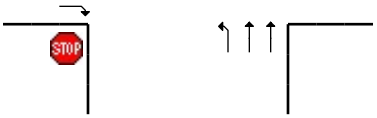


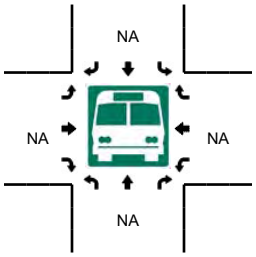












5-Min Count Period Beginning At	Sierra College Blvd (Northbound)				Sierra College Blvd (Southbound)				Dwy S of Brace Rd (Eastbound)				Dwy S of Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	76	0	0	0	67	0	0	0	0	0	0	0	0	0	0	144	
4:05 PM	1	73	0	0	0	79	0	0	0	0	1	0	0	0	0	0	154	
4:10 PM	0	71	0	0	0	98	0	0	0	0	0	0	0	0	0	0	169	
4:15 PM	1	95	0	0	0	73	0	0	0	0	0	0	0	0	0	0	169	
4:20 PM	0	87	0	0	0	83	0	0	0	0	2	0	0	0	0	0	172	
4:25 PM	0	93	0	0	0	53	0	0	0	0	1	0	0	0	0	0	147	
4:30 PM	0	83	0	0	0	80	0	0	0	0	1	0	0	0	0	0	164	
4:35 PM	0	76	0	1	0	66	0	0	0	0	1	0	0	0	0	0	144	
4:40 PM	0	87	0	0	0	94	0	0	0	0	0	0	0	0	0	0	181	
4:45 PM	0	79	0	0	0	71	2	0	0	0	3	0	0	0	0	0	155	
4:50 PM	0	84	0	0	0	74	0	0	0	0	0	0	0	0	0	0	158	
4:55 PM	0	90	0	0	0	64	0	0	0	0	0	0	0	0	0	0	154	1911
5:00 PM	0	73	0	0	0	86	0	0	0	0	5	0	0	0	0	0	164	1931
5:05 PM	1	95	0	0	0	78	0	0	0	0	4	0	0	0	0	0	178	1955
5:10 PM	0	70	0	0	0	91	0	0	0	0	3	0	0	0	0	0	164	1950
5:15 PM	0	99	0	0	0	67	0	0	0	0	1	0	0	0	0	0	167	1948
5:20 PM	0	85	0	1	0	78	0	0	0	0	1	0	0	0	0	0	165	1941
5:25 PM	0	84	0	1	0	98	0	0	0	0	2	0	0	0	0	0	185	1979
5:30 PM	0	78	0	1	0	84	0	0	0	0	0	0	0	0	0	0	163	1978
5:35 PM	0	99	0	1	0	66	0	0	0	0	0	0	0	0	0	0	166	2000
5:40 PM	0	67	0	0	0	53	0	0	0	0	2	0	0	0	0	0	122	1941
5:45 PM	0	78	0	0	0	53	0	0	0	0	0	0	0	0	0	0	131	1917
5:50 PM	0	81	0	0	0	73	0	0	0	0	1	0	0	0	0	0	155	1914
5:55 PM	0	73	0	0	0	66	0	0	0	0	2	0	0	0	0	0	141	1901

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1072	0	8	0	972	0	0	0	0	16	0	0	0	0	0	2068
Heavy Trucks	0	16	0		0	28	0		0	0	0		0	0	0		44
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/6/2016 11:58 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

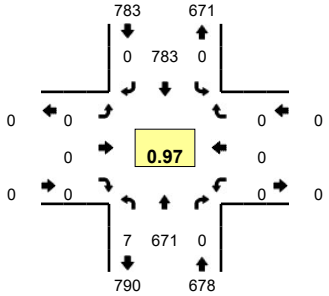
Type of peak hour being reported: Intersection Peak

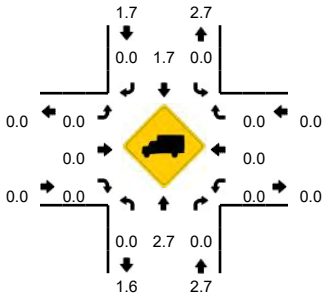
Method for determining peak hour: Total Entering Volume

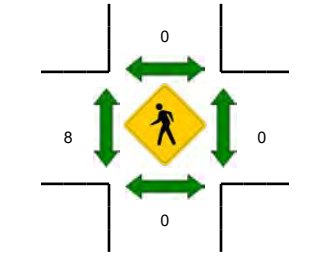
LOCATION: B8 - Sierra College Blvd -- Dwy S of Brace Rd
CITY/STATE: Placer, CA

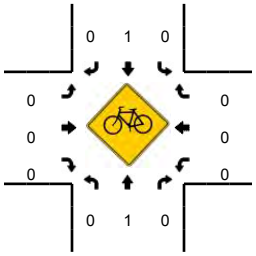
QC JOB #: 14088521
DATE: Sat, Jan 28 2017

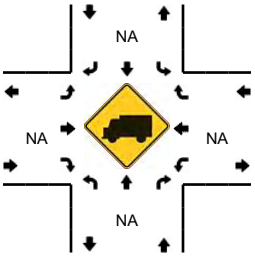
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:05 PM -- 12:20 PM

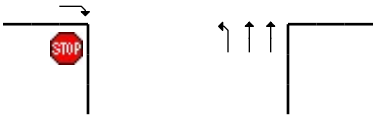


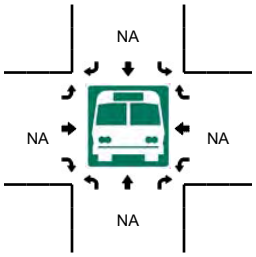












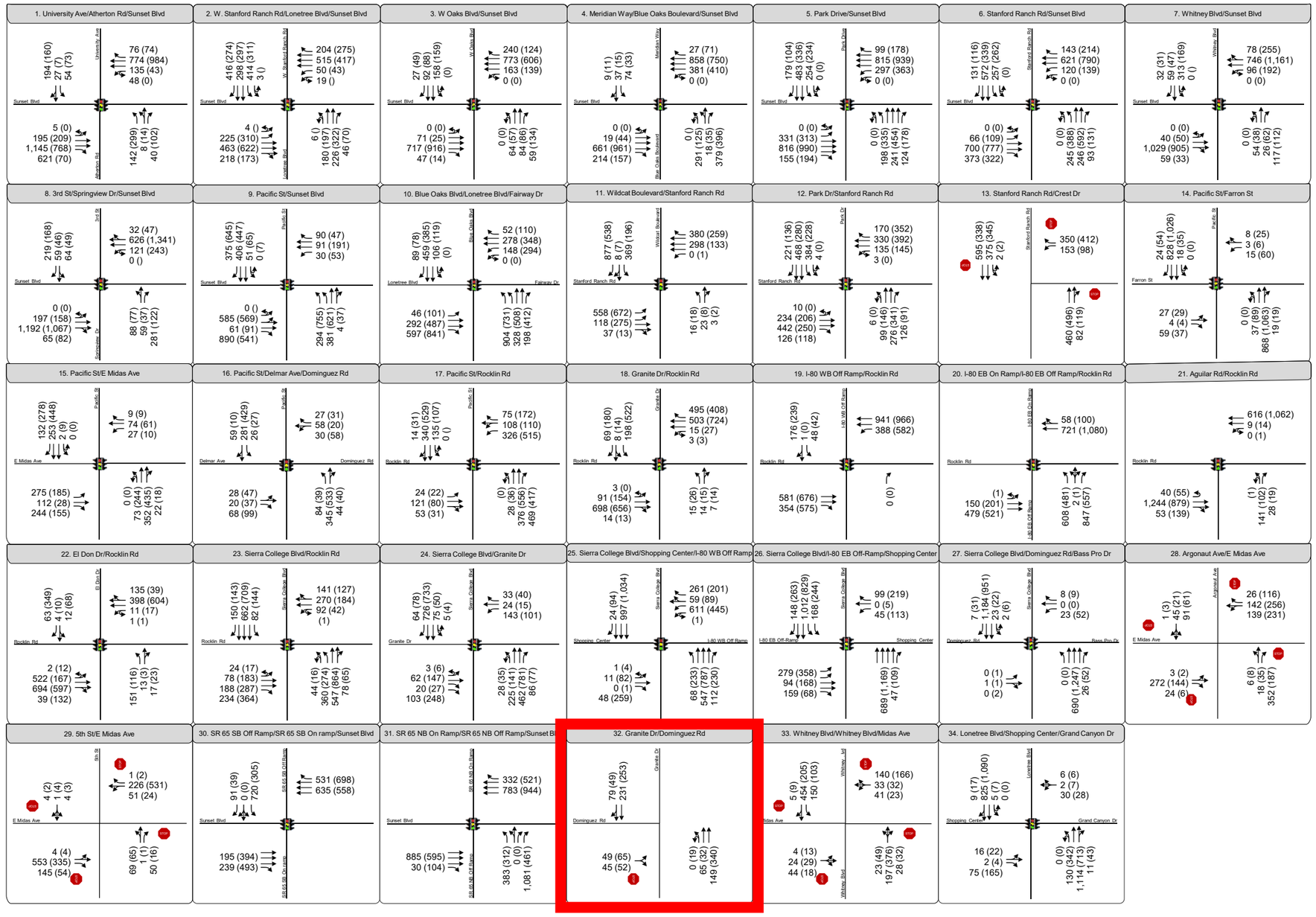
5-Min Count Period Beginning At	B8 - Sierra College Blvd (Northbound)				B8 - Sierra College Blvd (Southbound)				Dwy S of Brace Rd (Eastbound)				Dwy S of Brace Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	45	0	1	0	39	0	0	0	0	0	0	0	0	0	0	85	
11:05 AM	0	58	0	0	0	53	0	0	0	0	0	0	0	0	0	0	111	
11:10 AM	0	44	0	0	0	59	0	0	0	0	0	0	0	0	0	0	103	
11:15 AM	0	46	0	1	0	60	0	0	0	0	2	0	0	0	0	0	109	
11:20 AM	0	58	0	0	0	56	0	0	0	0	0	0	0	0	0	0	114	
11:25 AM	0	50	0	0	0	56	0	0	0	0	0	0	0	0	0	0	106	
11:30 AM	0	52	0	1	0	52	0	0	0	0	0	0	0	0	0	0	105	
11:35 AM	0	43	0	1	0	76	0	0	0	0	0	0	0	0	0	0	120	
11:40 AM	0	56	0	0	0	76	0	0	0	0	0	0	0	0	0	0	132	
11:45 AM	0	41	0	0	0	59	0	0	0	0	0	0	0	0	0	0	100	
11:50 AM	0	61	0	1	0	58	0	0	0	0	0	0	0	0	0	0	120	
11:55 AM	0	54	0	1	0	56	0	0	0	0	0	0	0	0	0	0	111	1316
12:00 PM	0	57	0	0	0	54	0	0	0	0	0	0	0	0	0	0	111	1342
12:05 PM	0	61	0	0	0	66	0	0	0	0	0	0	0	0	0	0	127	1358
12:10 PM	0	53	0	2	0	79	0	0	0	0	0	0	0	0	0	0	134	1389
12:15 PM	0	40	0	0	0	77	0	0	0	0	0	0	0	0	0	0	117	1397
12:20 PM	0	57	0	0	0	52	0	0	0	0	0	0	0	0	0	0	109	1392
12:25 PM	0	60	0	1	0	74	0	0	0	0	0	0	0	0	0	0	135	1421
12:30 PM	0	61	0	1	0	52	0	0	0	0	0	0	0	0	0	0	114	1430
12:35 PM	0	50	0	0	0	71	0	0	0	0	0	0	0	0	0	0	121	1431
12:40 PM	0	46	0	0	0	70	0	0	0	0	0	0	0	0	0	0	116	1415
12:45 PM	0	66	0	2	0	60	0	0	0	0	0	0	0	0	0	0	128	1443
12:50 PM	0	62	0	0	0	60	0	0	0	0	0	0	0	0	0	0	122	1445
12:55 PM	0	58	0	1	0	68	0	0	0	0	0	0	0	0	0	0	127	1461

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	616	0	8	0	888	0	0	0	0	0	0	0	0	0	0	1512
Heavy Trucks	0	16	0		0	4	0		0	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/7/2017 12:49 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Notes:
- Counts conducted at all locations in April 2016 while schools were in session.
- Only study intersections within Rocklin are shown.

Figure 4

Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

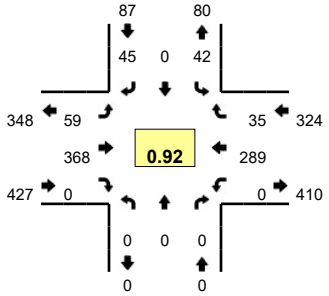
Type of peak hour being reported: Intersection Peak

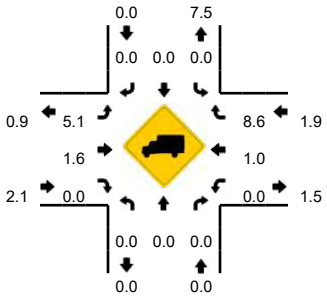
Method for determining peak hour: Total Entering Volume

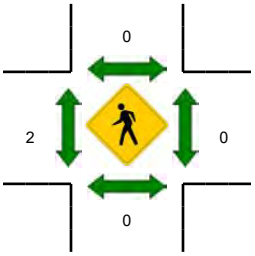
LOCATION: Dominguez Rd -- Granite Dr
CITY/STATE: Rocklin, CA

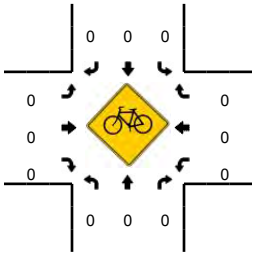
QC JOB #: 14508201
DATE: Sat, Sep 16 2017

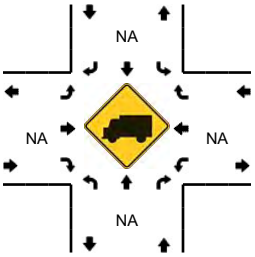
Peak-Hour: 11:25 AM -- 12:25 PM
Peak 15-Min: 11:35 AM -- 11:50 AM

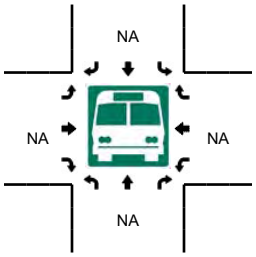












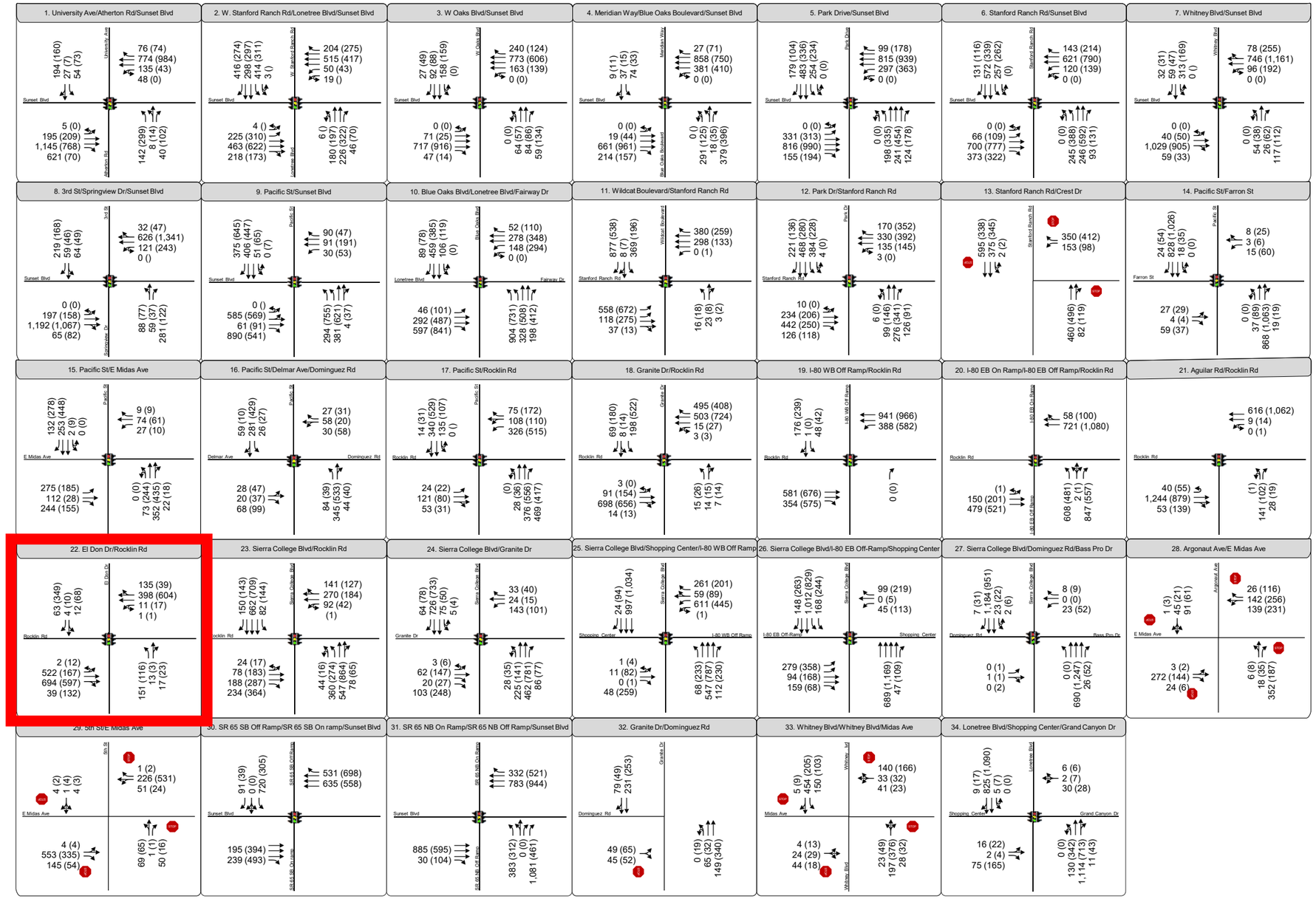
5-Min Count Period Beginning At	Dominguez Rd (Northbound)				Dominguez Rd (Southbound)				Granite Dr (Eastbound)				Granite Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	3	0	1	0	6	29	0	0	0	22	3	0	64	
11:05 AM	0	0	0	0	5	0	5	0	5	30	0	2	0	26	3	0	76	
11:10 AM	0	0	0	0	4	0	1	0	4	22	0	1	0	20	5	0	57	
11:15 AM	0	0	0	0	1	0	3	0	2	21	0	1	0	21	0	0	49	
11:20 AM	0	0	0	0	4	0	2	0	3	23	0	0	0	30	2	0	64	
11:25 AM	0	0	0	0	3	0	3	0	2	28	0	1	0	23	5	0	65	
11:30 AM	0	0	0	0	3	0	8	0	4	27	0	1	0	23	4	0	70	
11:35 AM	0	0	0	0	6	0	4	0	6	36	0	1	0	24	3	0	80	
11:40 AM	0	0	0	0	7	0	1	0	7	31	0	1	0	26	4	0	77	
11:45 AM	0	0	0	0	0	0	6	0	4	32	0	3	0	20	6	0	71	
11:50 AM	0	0	0	0	2	0	3	0	3	31	0	2	0	13	1	0	55	
11:55 AM	0	0	0	0	3	0	2	0	2	32	0	3	0	26	2	0	70	798
12:00 PM	0	0	0	0	2	0	1	0	3	42	0	0	0	30	3	0	81	815
12:05 PM	0	0	0	0	3	0	4	0	4	31	0	0	0	24	3	0	69	808
12:10 PM	0	0	0	0	5	0	5	0	3	23	0	1	0	19	3	0	59	810
12:15 PM	0	0	0	0	2	0	6	0	3	33	0	1	0	26	1	0	72	833
12:20 PM	0	0	0	0	6	0	2	0	4	22	0	0	0	35	0	0	69	838
12:25 PM	0	0	0	0	2	0	1	0	7	33	0	1	0	19	1	0	64	837
12:30 PM	0	0	0	0	1	0	2	0	1	34	0	1	0	19	6	0	64	831
12:35 PM	0	0	0	0	0	0	2	0	2	27	0	2	0	19	3	0	55	806
12:40 PM	0	0	0	0	2	0	3	0	4	35	0	0	0	27	3	0	74	803
12:45 PM	0	0	0	0	3	0	4	0	2	29	0	2	0	24	2	0	66	798
12:50 PM	0	0	0	0	5	0	1	0	7	37	0	3	0	17	1	0	71	814
12:55 PM	0	0	0	0	4	0	1	0	4	29	0	1	0	31	5	0	75	819

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	52	0	44	0	68	396	0	20	0	280	52	0	912
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	0	4		12
Pedestrians		0				0				8				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/21/2017 9:37 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



Turn Lane

AM (PM) Peak Hour Traffic Volume

Traffic Signal

Stop Sign

Notes:
- Counts conducted at all locations in April 2016 while schools were in session.
- Only study intersections within Rocklin are shown.

Figure 4
Peak Hour Traffic Volumes and Lane Configurations - Existing Conditions

3/30/2017

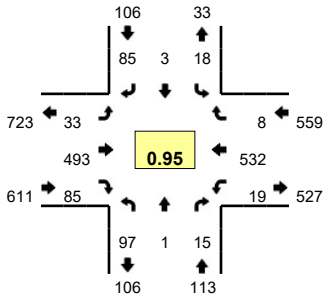
Type of peak hour being reported: Intersection Peak

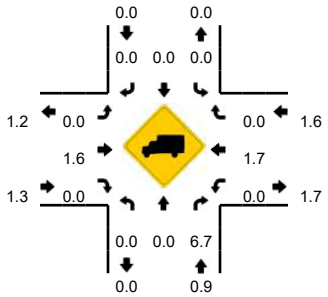
Method for determining peak hour: Total Entering Volume

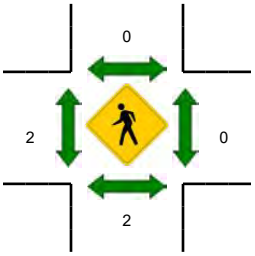
LOCATION: El Don Dr -- Rocklin Rd
CITY/STATE: Rocklin, CA

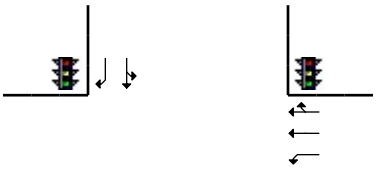
QC JOB #: 14508202
DATE: Sat, Sep 16 2017

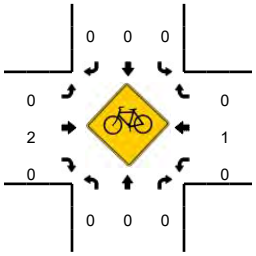
Peak-Hour: 11:25 AM -- 12:25 PM
Peak 15-Min: 12:00 PM -- 12:15 PM

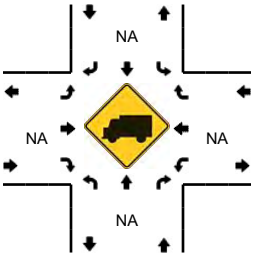


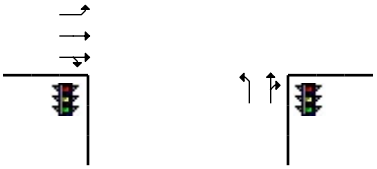


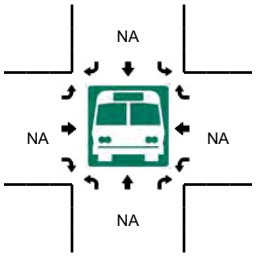












5-Min Count Period Beginning At	El Don Dr (Northbound)				El Don Dr (Southbound)				Rocklin Rd (Eastbound)				Rocklin Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	8	0	2	0	0	0	3	0	5	36	5	0	2	34	1	0	96	
11:05 AM	7	1	1	0	3	0	2	0	4	39	7	0	0	44	0	0	108	
11:10 AM	14	1	1	0	0	0	8	0	0	32	11	0	1	38	1	0	107	
11:15 AM	7	1	1	0	0	0	11	0	0	37	9	0	0	39	1	0	106	
11:20 AM	8	0	1	0	4	2	6	0	1	31	4	4	0	21	1	0	83	
11:25 AM	9	0	2	0	3	2	6	0	1	39	7	0	3	45	3	1	121	
11:30 AM	9	0	0	0	1	0	13	0	3	45	10	0	0	41	0	0	122	
11:35 AM	11	0	1	0	2	0	7	0	1	29	6	1	0	44	0	0	102	
11:40 AM	7	0	1	0	1	0	1	0	3	37	8	3	3	46	0	0	110	
11:45 AM	8	0	3	0	0	1	12	0	1	38	7	1	0	43	1	0	115	
11:50 AM	10	0	1	0	4	0	4	0	0	41	6	0	1	50	1	0	118	
11:55 AM	7	0	3	0	1	0	3	0	5	43	8	1	1	41	1	0	114	1302
12:00 PM	7	0	0	0	4	0	8	0	0	54	7	0	1	37	0	0	118	1324
12:05 PM	12	0	0	0	1	0	9	0	1	39	4	2	3	44	0	0	115	1331
12:10 PM	7	0	1	0	1	0	10	0	4	44	7	0	3	54	0	0	131	1355
12:15 PM	4	0	2	0	0	0	8	0	3	42	5	1	1	47	1	0	114	1363
12:20 PM	6	1	1	0	0	0	4	0	2	42	10	0	2	40	1	0	109	1389
12:25 PM	8	0	1	0	0	0	8	0	0	45	5	0	0	43	1	0	111	1379
12:30 PM	8	0	2	0	0	0	5	0	2	55	9	2	1	22	2	0	108	1365
12:35 PM	8	1	1	0	2	0	5	0	0	51	10	0	1	37	2	0	118	1381
12:40 PM	4	0	3	0	2	0	2	0	2	39	10	1	1	40	1	0	105	1376
12:45 PM	5	0	2	0	1	0	2	0	0	43	15	1	0	56	0	0	125	1386
12:50 PM	8	0	2	0	1	0	4	0	0	51	8	0	0	39	0	0	113	1381
12:55 PM	13	0	1	0	1	0	4	0	2	36	4	1	1	31	0	0	94	1361

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	0	4	0	24	0	108	0	20	548	72	8	28	540	0	0	1456
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	12	0		16
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/21/2017 9:37 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

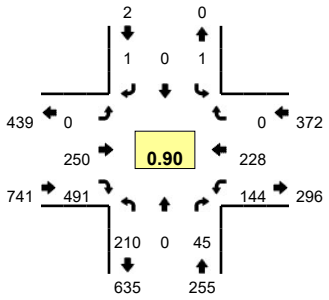
Type of peak hour being reported: Intersection Peak

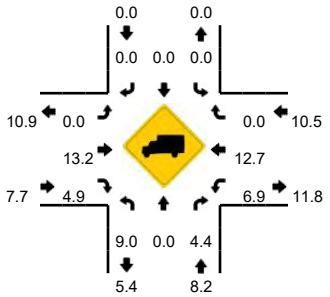
Method for determining peak hour: Total Entering Volume

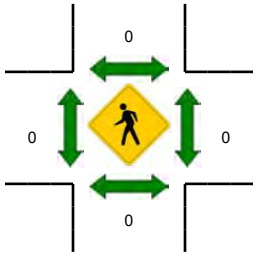
LOCATION: 28. Sierra College Blvd -- SR 193 (Lincoln Newcastle Hwy)
CITY/STATE: Loomis, CA

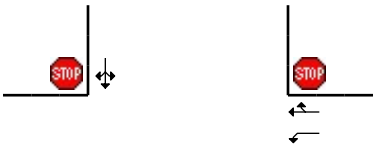
QC JOB #: 14812801
DATE: Wed, Oct 10 2018

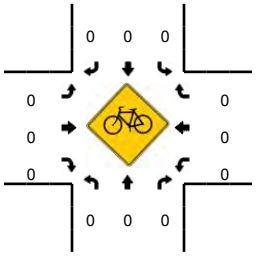
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

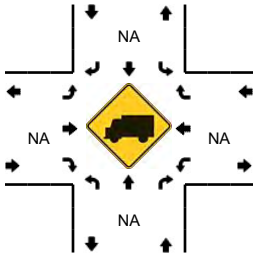


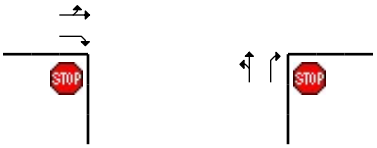


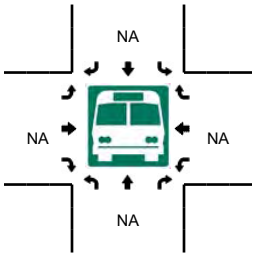












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				SR 193 (Lincoln Newcastle Hwy) (Eastbound)				SR 193 (Lincoln Newcastle Hwy) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	9	0	1	0	0	0	0	0	0	14	26	0	14	10	0	0	74	
7:05 AM	8	0	4	0	0	0	0	0	0	19	17	0	11	16	0	0	75	
7:10 AM	6	0	3	0	0	0	0	0	0	19	23	0	19	13	0	0	83	
7:15 AM	13	0	2	0	0	0	0	0	0	14	34	0	12	16	0	0	91	
7:20 AM	21	0	7	0	0	0	0	0	0	21	51	0	17	12	0	0	129	
7:25 AM	15	0	2	0	0	0	0	0	0	12	47	0	14	14	0	0	104	
7:30 AM	9	0	2	0	0	0	0	0	0	14	41	0	12	21	0	0	99	
7:35 AM	9	0	5	0	0	0	0	0	0	21	51	0	20	25	0	0	131	
7:40 AM	24	0	1	0	0	0	1	0	0	21	46	0	11	33	0	0	137	
7:45 AM	18	0	3	0	0	0	0	0	0	25	39	0	7	22	0	0	114	
7:50 AM	26	0	4	0	0	0	0	0	0	17	42	0	12	14	0	0	115	
7:55 AM	15	0	4	0	0	0	0	0	0	20	35	0	14	20	0	0	108	1260
8:00 AM	24	0	2	0	0	0	0	0	0	22	39	0	10	14	0	0	111	1297
8:05 AM	16	0	5	0	0	0	0	0	0	26	38	0	10	22	0	0	117	1339
8:10 AM	15	0	3	0	1	0	0	0	0	22	40	0	10	14	0	0	105	1361
8:15 AM	18	0	7	0	0	0	0	0	0	29	22	0	7	17	0	0	100	1370
8:20 AM	14	1	4	0	0	0	0	0	0	14	16	0	11	20	0	0	80	1321
8:25 AM	20	1	4	0	0	0	0	0	0	14	36	0	14	18	0	0	107	1324
8:30 AM	20	0	6	0	0	0	0	0	0	18	24	0	6	10	0	0	84	1309
8:35 AM	14	0	5	0	0	0	1	0	0	17	20	0	9	9	0	0	75	1253
8:40 AM	19	0	6	0	0	0	0	0	0	19	20	0	5	13	0	0	82	1198
8:45 AM	15	0	11	0	0	0	0	0	0	16	25	0	15	15	0	0	97	1181
8:50 AM	12	1	3	0	0	1	0	0	0	19	21	0	9	15	0	0	81	1147
8:55 AM	13	0	7	0	0	0	0	0	0	14	23	0	7	12	0	0	76	1115

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	204	0	36	0	0	0	4	0	0	268	544	0	152	320	0	0	1528
Heavy Trucks	8	0	0		0	0	0		0	16	40		8	24	0		96
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

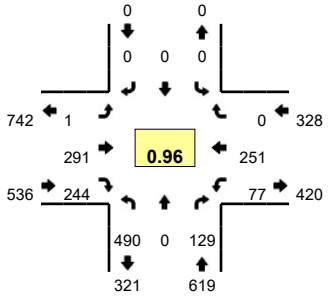
Type of peak hour being reported: Intersection Peak

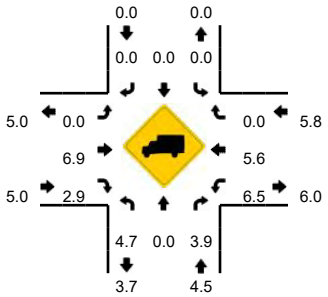
Method for determining peak hour: Total Entering Volume

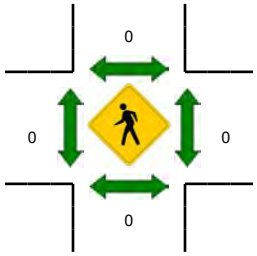
LOCATION: 28. Sierra College Blvd -- SR 193 (Lincoln Newcastle Hwy)
CITY/STATE: Loomis, CA

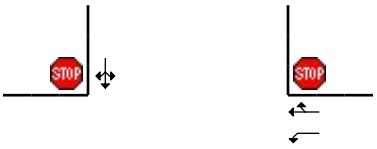
QC JOB #: 14812802
DATE: Wed, Oct 10 2018

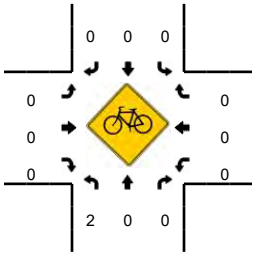
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:35 PM -- 5:50 PM

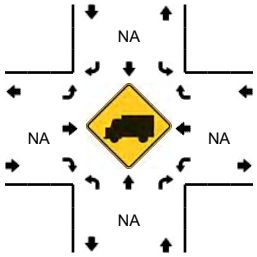


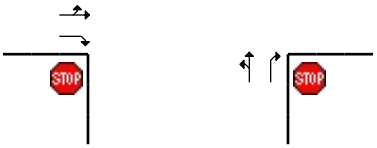


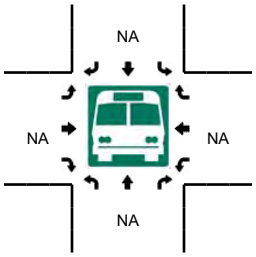












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				SR 193 (Lincoln Newcastle Hwy) (Eastbound)				SR 193 (Lincoln Newcastle Hwy) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	39	0	12	0	0	0	0	0	0	26	10	0	8	22	0	0	117	
4:05 PM	42	0	17	0	0	0	0	0	0	17	16	0	10	18	0	0	120	
4:10 PM	45	0	7	0	0	0	0	0	0	17	26	0	7	27	0	0	129	
4:15 PM	40	0	7	0	0	0	0	0	0	31	21	0	4	20	0	0	123	
4:20 PM	44	0	15	0	0	0	0	0	0	19	18	0	6	20	0	0	122	
4:25 PM	48	0	12	0	0	0	0	0	0	18	26	0	4	19	0	0	127	
4:30 PM	34	0	11	0	0	0	0	0	0	16	23	0	11	20	0	0	115	
4:35 PM	41	0	15	0	0	0	0	0	0	21	11	0	9	19	0	0	116	
4:40 PM	44	0	7	0	0	0	0	0	0	18	14	0	10	17	0	0	110	
4:45 PM	43	0	4	0	0	0	0	0	0	25	27	0	9	23	0	0	131	
4:50 PM	43	0	7	0	0	0	0	0	0	25	22	0	8	16	0	0	121	
4:55 PM	42	0	7	0	0	0	0	0	0	27	10	0	8	13	0	0	107	1438
5:00 PM	46	0	10	0	0	0	0	0	0	23	25	1	4	14	0	0	123	1444
5:05 PM	41	0	12	0	0	0	0	0	0	23	21	0	8	20	0	0	125	1449
5:10 PM	24	0	4	0	0	0	0	0	0	25	27	0	4	31	0	0	115	1435
5:15 PM	52	0	22	0	0	0	0	0	0	13	16	0	4	20	0	0	127	1439
5:20 PM	38	0	14	0	0	0	0	0	0	24	22	0	3	27	0	0	128	1445
5:25 PM	42	0	10	0	0	0	0	0	0	22	18	0	10	26	0	0	128	1446
5:30 PM	41	0	6	0	0	0	0	0	0	22	15	0	10	29	0	0	123	1454
5:35 PM	42	0	12	0	0	0	0	0	0	26	22	0	7	13	0	0	122	1460
5:40 PM	39	0	8	0	0	0	0	0	0	31	24	0	5	21	0	0	128	1478
5:45 PM	40	0	17	0	0	0	0	0	0	30	22	0	6	21	0	0	136	1483
5:50 PM	47	0	11	0	0	0	0	0	0	14	12	0	13	13	0	0	110	1472
5:55 PM	42	0	9	0	0	0	0	0	1	17	12	0	9	18	0	0	108	1473

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	484	0	148	0	0	0	0	0	0	348	272	0	72	220	0	0	1544
Heavy Trucks	28	0	4		0	0	0		0	20	8		4	16	0		80
Pedestrians		0				0				0				0			0
Bicycles	1	0	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

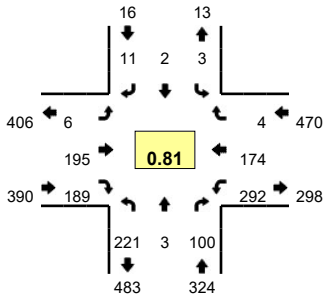
Type of peak hour being reported: Intersection Peak

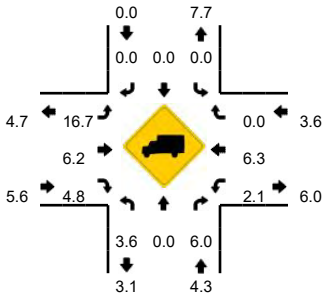
Method for determining peak hour: Total Entering Volume

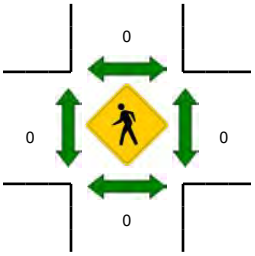
LOCATION: 28. Sierra College Blvd -- SR 193 (Lincoln Newcastle Hwy)
CITY/STATE: Loomis, CA

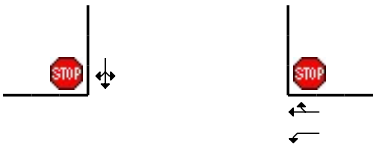
QC JOB #: 14812803
DATE: Sat, Oct 13 2018

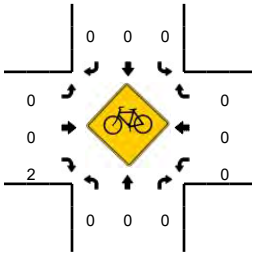
Peak-Hour: 11:30 AM -- 12:30 PM
Peak 15-Min: 11:50 AM -- 12:05 PM

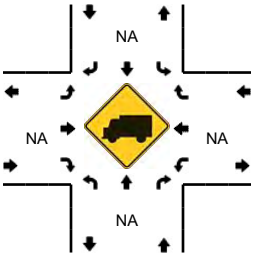


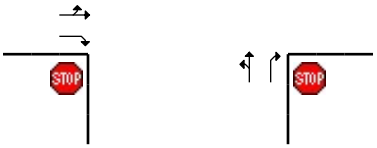


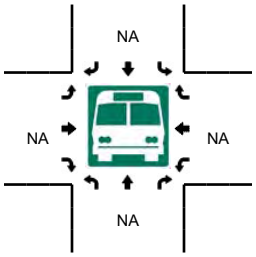












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				SR 193 (Lincoln Newcastle Hwy) (Eastbound)				SR 193 (Lincoln Newcastle Hwy) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	15	0	9	0	1	0	2	0	0	12	21	0	9	15	1	0	85	
11:05 AM	11	1	4	0	0	1	1	0	2	9	9	0	9	14	0	0	61	
11:10 AM	18	0	4	0	0	0	0	0	2	13	22	0	9	23	1	0	92	
11:15 AM	16	1	7	0	0	0	2	0	1	14	17	0	6	17	0	0	81	
11:20 AM	11	0	10	0	0	0	0	0	1	16	16	0	4	16	1	0	75	
11:25 AM	17	1	7	0	0	0	0	0	0	13	14	0	10	11	2	0	75	
11:30 AM	17	0	12	0	0	0	2	0	0	11	16	0	10	19	1	0	88	
11:35 AM	14	1	7	0	0	0	0	0	1	19	21	0	32	14	0	0	109	
11:40 AM	20	0	11	0	1	0	2	0	2	24	17	0	7	21	1	0	106	
11:45 AM	15	0	5	0	0	1	1	0	0	19	12	0	6	12	0	0	71	
11:50 AM	18	0	9	0	0	0	0	0	0	8	12	0	79	18	0	0	144	
11:55 AM	27	1	9	0	0	0	1	0	1	19	17	0	57	6	0	0	138	1125
12:00 PM	13	1	5	0	0	1	0	0	0	10	19	0	30	9	0	0	88	1128
12:05 PM	15	0	9	0	0	0	2	0	0	23	15	0	39	8	1	0	112	1179
12:10 PM	19	0	8	0	2	0	2	0	1	19	15	0	11	10	1	0	88	1175
12:15 PM	20	0	6	0	0	0	0	0	0	14	11	0	8	17	0	0	76	1170
12:20 PM	21	0	9	0	0	0	1	0	1	13	15	0	9	20	0	0	89	1184
12:25 PM	22	0	10	0	0	0	0	0	0	16	19	0	4	20	0	0	91	1200
12:30 PM	21	0	9	0	0	0	1	0	1	17	14	0	5	9	0	0	77	1189
12:35 PM	22	0	13	0	0	0	0	0	0	13	13	0	12	12	1	0	86	1166
12:40 PM	19	0	5	0	0	0	0	0	0	19	14	0	6	15	0	0	78	1138
12:45 PM	18	1	15	0	0	0	1	0	0	22	16	0	8	18	1	0	100	1167
12:50 PM	19	0	14	0	0	0	1	0	1	14	17	0	8	15	0	0	89	1112
12:55 PM	17	0	3	0	1	2	1	0	1	13	14	0	6	10	2	0	70	1044

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	232	8	92	0	0	4	4	0	4	148	192	0	664	132	0	0	1480
Heavy Trucks	12	0	4		0	0	0		4	8	12		8	8	0		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

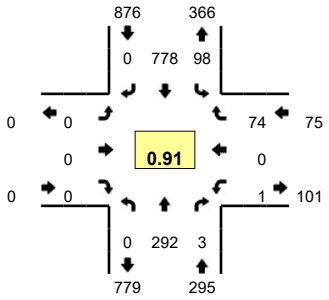
Type of peak hour being reported: Intersection Peak

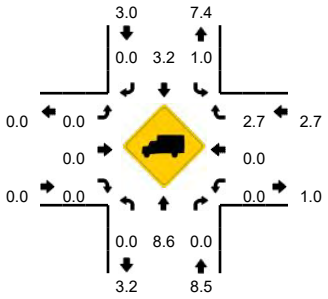
Method for determining peak hour: Total Entering Volume

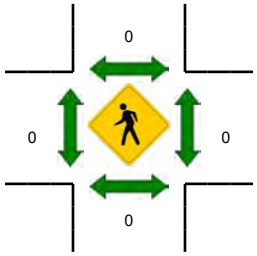
LOCATION: 28. Sierra College Blvd -- English Colony Way
CITY/STATE: Loomis, CA

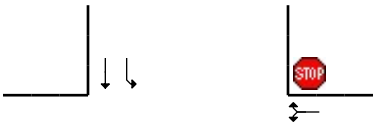
QC JOB #: 14812804
DATE: Wed, Oct 10 2018

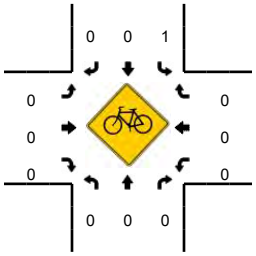
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

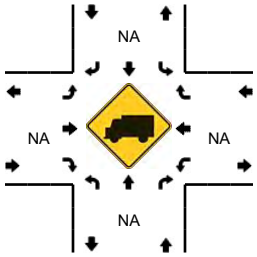


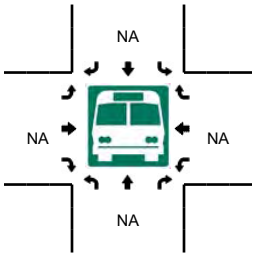












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				English Colony Way (Eastbound)				English Colony Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	15	1	0	1	48	0	0	0	0	0	0	0	0	7	0	72	
7:05 AM	0	21	0	0	5	48	0	0	0	0	0	0	0	0	1	0	75	
7:10 AM	0	15	0	0	2	50	0	0	0	0	0	0	0	0	3	0	70	
7:15 AM	0	24	0	0	7	51	0	0	0	0	0	0	0	0	3	0	85	
7:20 AM	0	32	1	0	6	61	0	0	0	0	0	0	0	0	9	0	109	
7:25 AM	0	19	0	0	11	72	0	0	0	0	0	0	0	0	6	0	108	
7:30 AM	0	13	0	0	7	72	0	0	0	0	0	0	0	0	5	0	97	
7:35 AM	0	17	0	0	8	66	0	0	0	0	0	0	0	0	9	0	100	
7:40 AM	0	25	0	0	6	83	0	0	0	0	0	0	1	0	5	0	120	
7:45 AM	0	32	0	0	7	81	0	0	0	0	0	0	0	0	2	0	122	
7:50 AM	0	24	0	0	6	61	0	0	0	0	0	0	0	0	6	0	97	
7:55 AM	0	35	0	0	7	63	0	0	0	0	0	0	0	0	6	0	111	1166
8:00 AM	0	22	0	0	21	55	0	0	0	0	0	0	0	0	3	0	101	1195
8:05 AM	0	23	1	0	6	51	0	0	0	0	0	0	0	0	14	0	95	1215
8:10 AM	0	24	1	0	7	56	0	0	0	0	0	0	0	0	5	0	93	1238
8:15 AM	0	26	0	0	6	57	0	0	0	0	0	0	0	0	4	0	93	1246
8:20 AM	0	28	0	0	4	33	0	0	0	0	0	0	0	0	6	0	71	1208
8:25 AM	0	27	0	0	6	37	0	0	0	0	0	0	0	0	5	0	75	1175
8:30 AM	0	28	1	0	6	51	0	0	0	0	0	0	0	0	9	0	95	1173
8:35 AM	0	22	0	0	4	40	0	0	0	0	0	0	0	0	1	0	67	1140
8:40 AM	0	33	1	0	2	40	0	0	0	0	0	0	0	0	10	0	86	1106
8:45 AM	0	21	0	0	0	47	0	0	0	0	0	0	0	0	5	0	73	1057
8:50 AM	0	22	2	0	2	45	0	0	0	0	0	0	0	0	3	0	74	1034
8:55 AM	0	22	0	0	2	42	0	0	0	0	0	0	2	0	5	0	73	996

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	296	0	0	84	920	0	0	0	0	0	0	4	0	64	0	1368
Heavy Trucks	0	28	0		0	28	0		0	0	0		0	0	0		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

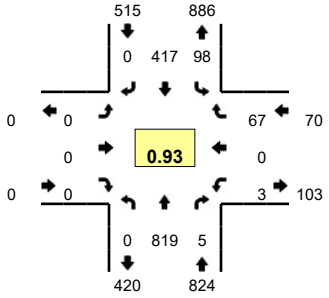
Type of peak hour being reported: Intersection Peak

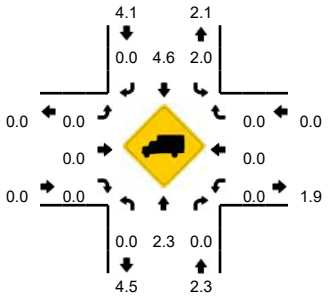
Method for determining peak hour: Total Entering Volume

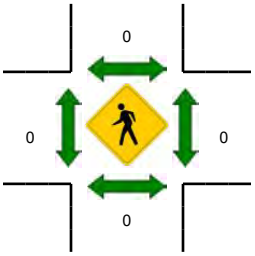
LOCATION: 28. Sierra College Blvd -- English Colony Way
CITY/STATE: Loomis, CA

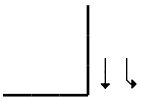
QC JOB #: 14812805
DATE: Wed, Oct 10 2018

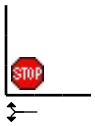
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

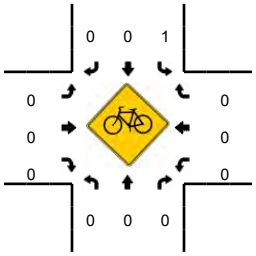


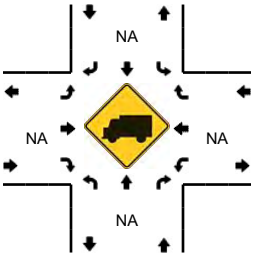


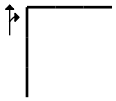


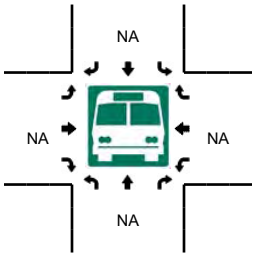












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				English Colony Way (Eastbound)				English Colony Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	68	0	0	7	35	0	0	0	0	0	0	1	0	7	0	118	
4:05 PM	0	56	0	0	7	41	0	0	0	0	0	0	1	0	12	0	117	
4:10 PM	0	70	0	0	9	31	0	0	0	0	0	0	0	0	6	0	116	
4:15 PM	0	71	1	0	10	49	0	0	0	0	0	0	1	0	7	0	139	
4:20 PM	0	62	0	0	8	33	0	0	0	0	0	0	0	0	9	0	112	
4:25 PM	0	57	3	0	6	37	0	0	0	0	0	0	0	0	6	0	109	
4:30 PM	0	85	1	0	5	34	0	0	0	0	0	0	1	0	7	0	133	
4:35 PM	0	49	1	0	8	37	0	0	0	0	0	0	0	0	12	0	107	
4:40 PM	0	62	1	0	5	38	0	0	0	0	0	0	0	0	8	0	114	
4:45 PM	0	67	0	0	8	29	0	0	0	0	0	0	0	0	9	0	113	
4:50 PM	0	64	0	0	8	37	0	0	0	0	0	0	0	0	8	0	117	
4:55 PM	0	62	1	0	8	35	0	0	0	0	0	0	0	0	4	0	110	1405
5:00 PM	0	59	0	0	6	26	0	0	0	0	0	0	0	0	2	0	93	1380
5:05 PM	0	60	0	0	8	37	0	0	0	0	0	0	0	0	7	0	112	1375
5:10 PM	0	59	1	0	8	38	0	0	0	0	0	0	1	0	12	0	119	1378
5:15 PM	0	63	0	0	13	38	0	0	0	0	0	0	0	0	3	0	117	1356
5:20 PM	0	91	0	0	8	34	0	0	0	0	0	0	0	0	3	0	136	1380
5:25 PM	0	76	2	0	8	21	0	0	0	0	0	0	0	0	6	0	113	1384
5:30 PM	0	78	1	0	5	39	0	0	0	0	0	0	0	0	5	0	128	1379
5:35 PM	0	72	0	0	11	33	0	0	0	0	0	0	0	0	5	0	121	1393
5:40 PM	0	74	0	0	7	39	0	0	0	0	0	0	1	0	3	0	124	1403
5:45 PM	0	61	0	0	8	40	0	0	0	0	0	0	1	0	9	0	119	1409
5:50 PM	0	44	1	0	1	31	0	0	0	0	0	0	0	0	5	0	82	1374
5:55 PM	0	41	0	0	6	29	0	0	0	0	0	0	0	0	5	0	81	1345

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	980	12	0	84	376	0	0	0	0	0	0	0	0	56	0	1508
Heavy Trucks	0	32	0		4	16	0		0	0	0		0	0	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		1	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

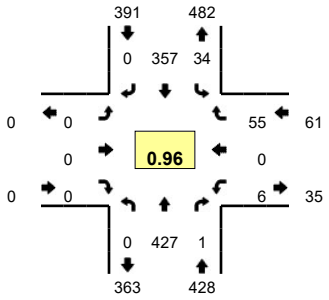
Type of peak hour being reported: Intersection Peak

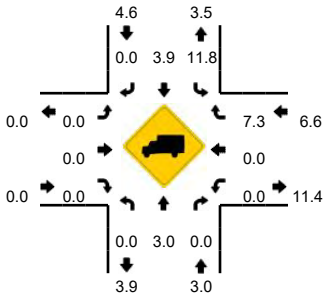
Method for determining peak hour: Total Entering Volume

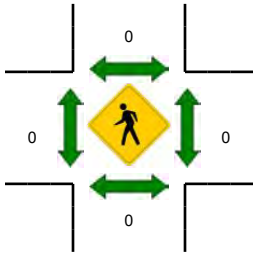
LOCATION: 28. Sierra College Blvd -- English Colony Way
CITY/STATE: Loomis, CA

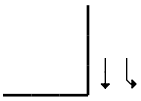
QC JOB #: 14812806
DATE: Sat, Oct 13 2018

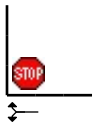
Peak-Hour: 11:50 AM -- 12:50 PM
Peak 15-Min: 12:20 PM -- 12:35 PM

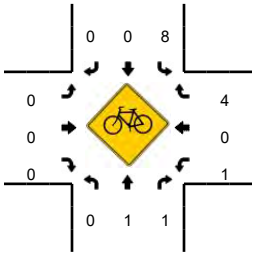


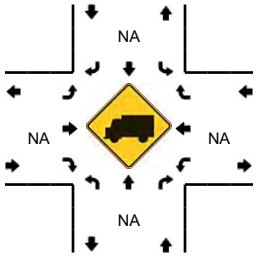


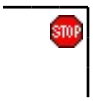


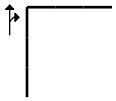


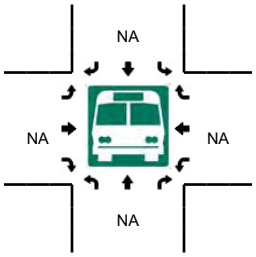












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				English Colony Way (Eastbound)				English Colony Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	14	2	0	3	28	0	0	0	0	0	0	1	0	5	0	53	
11:05 AM	0	22	0	0	9	33	0	0	0	0	0	0	0	0	5	0	69	
11:10 AM	0	22	0	0	3	29	0	0	0	0	0	0	0	0	2	0	56	
11:15 AM	0	29	0	0	7	33	0	0	0	0	0	0	0	0	5	0	74	
11:20 AM	0	31	0	0	3	37	0	0	0	0	0	0	0	0	2	0	73	
11:25 AM	0	28	0	0	5	32	0	0	0	0	0	0	0	0	5	0	70	
11:30 AM	0	27	0	0	6	29	0	0	0	0	0	0	0	0	8	0	70	
11:35 AM	0	33	0	0	2	23	0	0	0	0	0	0	1	0	6	0	65	
11:40 AM	0	23	0	0	1	41	0	0	0	0	0	0	0	0	5	0	70	
11:45 AM	0	34	1	0	0	33	0	0	0	0	0	0	0	0	3	0	71	
11:50 AM	0	34	0	0	5	21	0	0	0	0	0	0	0	0	7	0	67	
11:55 AM	0	30	0	0	3	31	0	0	0	0	0	0	0	0	6	0	70	808
12:00 PM	0	35	0	0	2	28	0	0	0	0	0	0	2	0	3	0	70	825
12:05 PM	0	33	0	0	3	36	0	0	0	0	0	0	1	0	4	0	77	833
12:10 PM	0	34	0	0	3	28	0	0	0	0	0	0	1	0	3	0	69	846
12:15 PM	0	37	0	0	2	26	0	0	0	0	0	0	1	0	5	0	71	843
12:20 PM	0	33	0	0	6	31	0	0	0	0	0	0	0	0	4	0	74	844
12:25 PM	0	35	0	0	4	33	0	0	0	0	0	0	0	0	3	0	75	849
12:30 PM	0	42	0	0	1	32	0	0	0	0	0	0	0	0	4	0	79	858
12:35 PM	0	29	0	0	0	33	0	0	0	0	0	0	0	0	6	0	68	861
12:40 PM	0	36	1	0	2	28	0	0	0	0	0	0	0	0	4	0	71	862
12:45 PM	0	49	0	0	3	30	0	0	0	0	0	0	1	0	6	0	89	880
12:50 PM	0	26	0	0	2	33	0	0	0	0	0	0	2	0	1	0	64	877
12:55 PM	0	29	1	0	6	29	0	0	0	0	0	0	0	0	5	0	70	877

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	440	0	0	44	384	0	0	0	0	0	0	0	0	44	0	912
Heavy Trucks	0	16	0		4	8	0		0	0	0		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		4	0	0		0	0	0		0	0	0		4
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

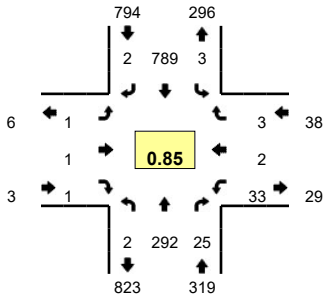
Type of peak hour being reported: Intersection Peak

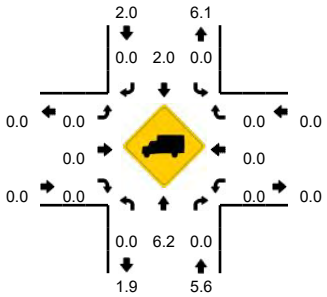
Method for determining peak hour: Total Entering Volume

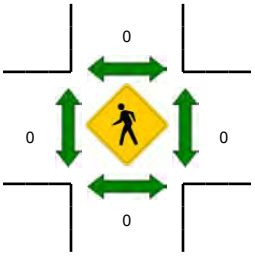
LOCATION: 28. Sierra College Blvd -- Delmar Ave
CITY/STATE: Loomis, CA

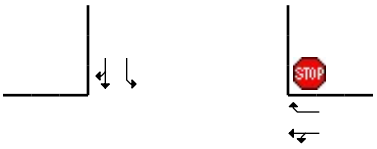
QC JOB #: 14812807
DATE: Wed, Oct 10 2018

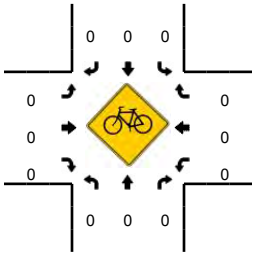
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

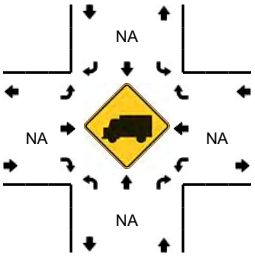


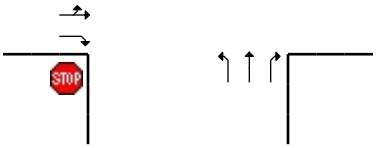


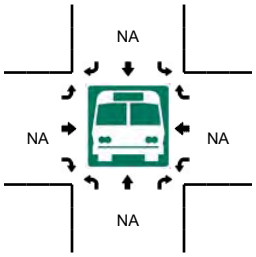












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				Delmar Ave (Eastbound)				Delmar Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	19	3	0	0	48	0	0	0	0	0	0	2	0	0	0	72	
7:05 AM	0	23	2	0	0	56	0	0	0	0	0	0	5	0	0	0	86	
7:10 AM	1	25	1	0	0	38	0	0	0	0	1	0	2	0	0	0	68	
7:15 AM	0	23	0	0	0	54	0	0	1	0	0	0	3	0	0	0	81	
7:20 AM	0	27	5	0	0	54	0	0	0	0	0	0	3	0	0	0	89	
7:25 AM	0	15	3	0	0	81	1	0	0	0	0	0	3	0	0	0	103	
7:30 AM	1	16	0	0	0	68	0	0	0	0	1	0	2	1	0	0	89	
7:35 AM	0	16	4	0	0	62	0	0	1	0	0	0	2	0	0	0	85	
7:40 AM	0	28	1	0	0	89	0	0	0	0	0	0	4	0	1	0	123	
7:45 AM	0	35	2	0	0	77	0	0	0	1	0	0	2	0	1	0	118	
7:50 AM	0	27	0	0	0	70	1	0	0	0	0	0	1	0	0	0	99	
7:55 AM	0	29	3	0	0	65	0	0	0	0	0	0	5	0	0	0	102	1115
8:00 AM	0	23	1	0	0	52	0	0	0	0	0	0	3	0	1	0	80	1123
8:05 AM	0	26	2	0	2	52	0	0	0	0	0	0	2	1	0	0	85	1122
8:10 AM	0	19	2	0	0	52	0	0	0	0	0	0	1	0	0	0	74	1128
8:15 AM	1	31	2	0	1	67	0	0	0	0	0	0	5	0	0	0	107	1154
8:20 AM	0	26	1	0	0	39	0	0	0	0	0	0	5	2	0	0	73	1138
8:25 AM	0	29	5	0	0	29	0	0	0	0	0	0	2	0	0	0	65	1100
8:30 AM	0	18	1	0	0	51	1	0	0	0	3	0	0	0	0	0	74	1085
8:35 AM	0	37	4	0	0	47	0	0	0	0	0	0	6	0	0	0	94	1094
8:40 AM	0	23	2	0	0	41	0	0	0	0	0	0	1	0	0	0	67	1038
8:45 AM	0	22	1	0	0	49	0	0	0	0	0	0	1	0	0	0	73	993
8:50 AM	1	29	2	0	0	44	0	0	0	0	0	0	3	0	0	0	79	973
8:55 AM	1	20	4	0	0	30	0	0	0	0	1	0	2	0	0	0	58	929

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	360	12	0	0	944	4	0	0	4	0	0	28	0	8	0	1360
Heavy Trucks	0	24	0		0	28	0		0	0	0		0	0	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

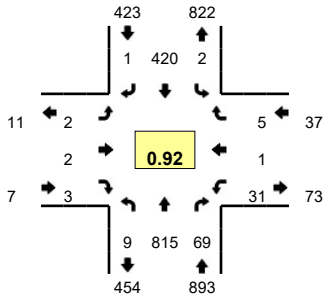
Type of peak hour being reported: Intersection Peak

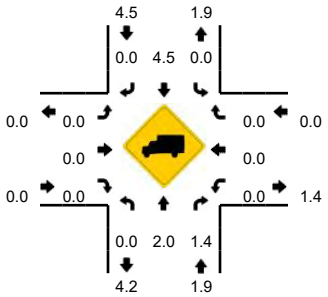
Method for determining peak hour: Total Entering Volume

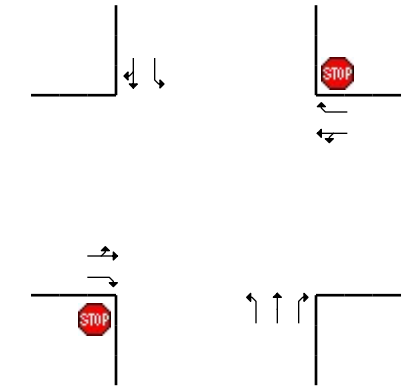
LOCATION: 28. Sierra College Blvd -- Delmar Ave
CITY/STATE: Loomis, CA

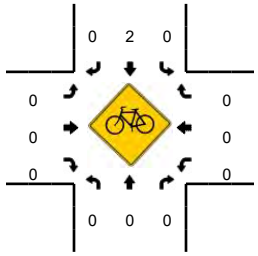
QC JOB #: 14812808
DATE: Wed, Oct 10 2018

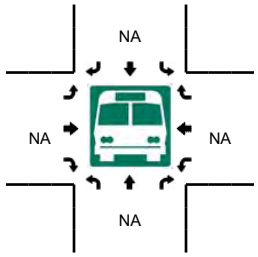
Peak-Hour: 4:50 PM -- 5:50 PM
Peak 15-Min: 5:10 PM -- 5:25 PM











5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				Delmar Ave (Eastbound)				Delmar Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	54	1	0	0	44	0	0	0	0	0	0	5	0	0	0	104	
4:05 PM	0	65	4	0	0	33	0	0	0	0	0	0	2	0	0	0	104	
4:10 PM	0	71	2	1	0	37	1	0	0	0	1	0	1	0	1	0	115	
4:15 PM	3	68	6	0	0	45	0	0	0	0	0	0	4	0	0	0	126	
4:20 PM	0	76	2	0	0	36	0	0	0	0	1	0	1	0	0	0	116	
4:25 PM	0	74	1	0	1	35	0	0	0	0	1	0	0	1	0	0	113	
4:30 PM	0	61	3	0	0	34	0	0	0	0	0	0	3	0	0	0	101	
4:35 PM	0	51	5	0	0	40	1	0	1	0	0	0	3	0	0	0	101	
4:40 PM	0	65	3	0	0	38	0	0	0	0	0	0	0	0	0	0	106	
4:45 PM	1	63	7	0	0	30	0	0	0	0	0	0	1	0	0	0	102	
4:50 PM	1	60	6	0	0	42	1	0	0	0	0	0	1	0	0	0	111	
4:55 PM	1	70	8	0	0	27	0	0	1	0	0	0	3	0	0	0	110	1309
5:00 PM	2	56	5	0	0	29	0	0	0	0	0	0	3	0	1	0	96	1301
5:05 PM	1	53	3	0	1	38	0	0	0	1	1	0	1	0	0	0	99	1296
5:10 PM	1	71	7	0	0	40	0	0	1	0	1	0	5	0	1	0	127	1308
5:15 PM	0	82	7	0	0	37	0	0	0	0	0	0	2	0	1	0	129	1311
5:20 PM	0	76	5	0	1	28	0	0	0	0	0	0	2	0	0	0	112	1307
5:25 PM	2	81	9	0	0	28	0	0	0	0	0	0	0	0	1	0	121	1315
5:30 PM	0	86	7	0	0	37	0	0	0	0	0	0	4	0	0	0	134	1348
5:35 PM	0	67	4	0	0	35	0	0	0	0	0	0	4	0	1	0	111	1358
5:40 PM	0	52	4	0	0	35	0	0	0	1	0	0	1	0	0	0	93	1345
5:45 PM	1	61	4	0	0	44	0	0	0	0	1	0	5	1	0	0	117	1360
5:50 PM	0	47	8	0	0	36	1	0	0	0	0	0	2	0	1	0	95	1344
5:55 PM	0	42	6	0	0	29	0	0	0	0	0	0	3	0	0	0	80	1314

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	916	76	0	4	420	0	0	4	0	4	0	36	0	8	0	1472
Heavy Trucks	0	12	0		0	8	0		0	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

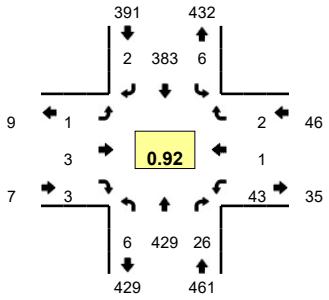
Type of peak hour being reported: Intersection Peak

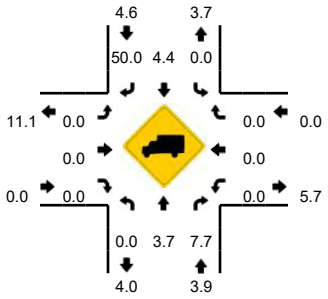
Method for determining peak hour: Total Entering Volume

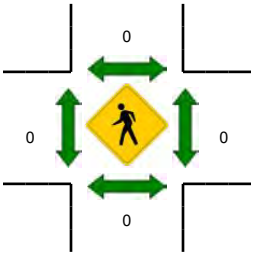
LOCATION: 28. Sierra College Blvd -- Delmar Ave
CITY/STATE: Loomis, CA

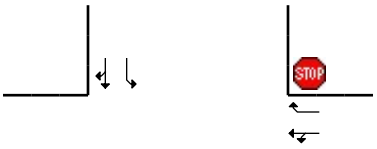
QC JOB #: 14812809
DATE: Sat, Oct 13 2018

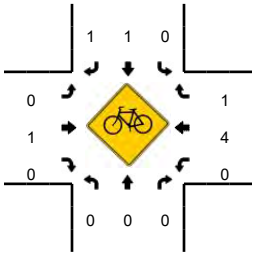
Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:30 PM -- 12:45 PM

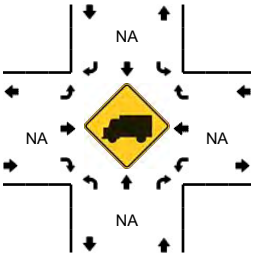


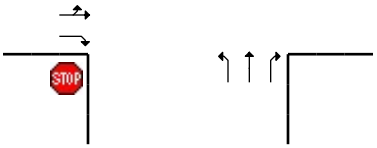


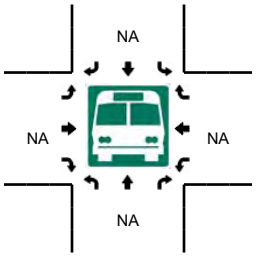












5-Min Count Period Beginning At	28. Sierra College Blvd (Northbound)				28. Sierra College Blvd (Southbound)				Delmar Ave (Eastbound)				Delmar Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	15	3	0	0	17	0	0	0	0	0	0	0	1	0	0	36	
11:05 AM	0	24	2	0	0	36	0	0	0	0	0	0	5	0	1	0	68	
11:10 AM	0	26	4	0	0	28	0	0	0	0	1	0	3	1	0	0	63	
11:15 AM	0	24	2	0	0	31	0	0	1	0	0	0	1	0	0	0	59	
11:20 AM	0	28	0	0	0	29	0	0	0	0	0	0	2	1	0	0	60	
11:25 AM	0	28	7	0	0	32	0	0	0	0	0	0	2	0	1	0	70	
11:30 AM	0	21	2	0	0	27	1	0	0	0	1	0	3	0	1	0	56	
11:35 AM	0	37	2	0	0	30	0	0	0	0	0	0	1	1	1	0	72	
11:40 AM	0	25	5	0	0	36	0	0	1	0	0	0	5	0	0	0	72	
11:45 AM	0	37	2	0	0	35	0	0	0	1	0	0	1	0	0	0	76	
11:50 AM	0	32	3	0	0	27	0	0	0	0	0	0	4	0	1	0	67	
11:55 AM	0	32	4	0	0	19	0	0	0	1	0	0	4	0	1	0	61	760
12:00 PM	1	31	3	0	0	34	0	0	0	0	0	0	2	0	0	0	71	795
12:05 PM	0	38	0	0	0	31	0	0	0	0	0	0	4	0	0	0	73	800
12:10 PM	0	33	4	0	0	38	0	0	0	1	3	0	1	0	0	0	80	817
12:15 PM	0	41	3	0	1	27	0	0	0	0	0	0	0	0	0	0	72	830
12:20 PM	2	31	1	0	0	31	1	0	0	0	0	0	5	0	0	0	71	841
12:25 PM	0	41	1	0	2	32	0	0	0	0	0	0	5	0	1	0	82	853
12:30 PM	1	42	0	0	0	37	0	0	0	0	0	0	4	0	0	0	84	881
12:35 PM	0	32	1	0	2	37	0	0	0	0	0	0	2	0	0	0	74	883
12:40 PM	1	44	4	0	1	30	0	0	0	0	0	0	7	0	0	0	87	898
12:45 PM	0	37	2	0	0	28	0	0	0	1	0	0	6	0	0	0	74	896
12:50 PM	0	24	4	0	0	30	0	0	1	1	0	0	2	1	1	0	64	893
12:55 PM	1	35	3	0	0	28	1	0	0	0	0	0	5	0	0	0	73	905

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	472	20	0	12	416	0	0	0	0	0	0	52	0	0	0	980
Heavy Trucks	0	28	4		0	24	0		0	0	0		0	0	0		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	1		0	0	0		0	1	1		3
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

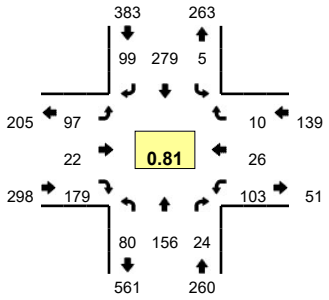
LOCATION: 29. Taylor Rd -- English Colony Way/Rock Springs Rd

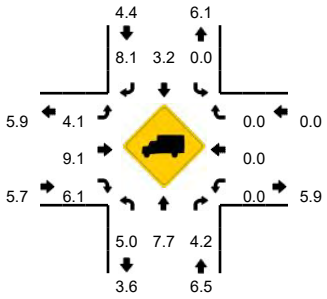
QC JOB #: 14812810

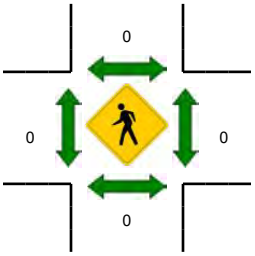
CITY/STATE: Loomis, CA

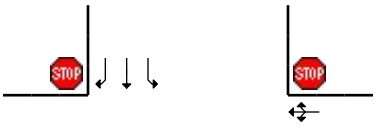
DATE: Wed, Oct 10 2018

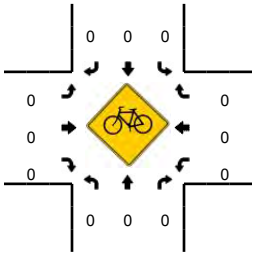
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

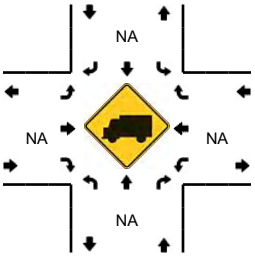


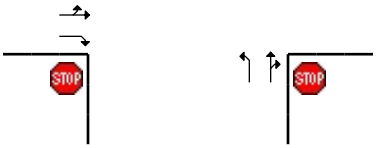


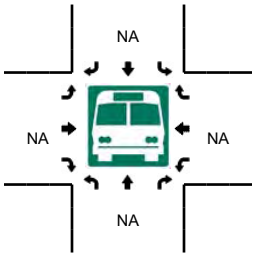












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				English Colony Way/Rock Springs Rd (Eastbound)				English Colony Way/Rock Springs Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	4	2	0	0	13	5	0	3	1	8	0	13	0	0	0	50	
7:05 AM	3	11	1	0	1	10	4	0	2	1	6	0	10	2	3	0	54	
7:10 AM	4	6	3	0	0	18	2	0	7	0	6	0	6	1	0	0	53	
7:15 AM	1	6	2	0	0	15	4	0	3	0	15	0	7	1	1	0	55	
7:20 AM	1	10	0	0	0	27	5	0	4	1	10	0	15	0	1	0	74	
7:25 AM	3	10	2	0	0	45	2	0	2	2	12	0	8	1	0	0	87	
7:30 AM	4	18	1	0	0	44	8	0	7	1	13	0	17	1	0	0	114	
7:35 AM	7	15	4	0	1	34	7	0	8	3	18	0	14	1	0	0	112	
7:40 AM	6	15	2	0	1	33	6	0	8	2	19	0	13	1	0	0	106	
7:45 AM	8	23	6	0	0	18	8	0	7	0	12	0	6	1	1	0	90	
7:50 AM	8	19	2	0	1	17	14	0	12	0	17	0	9	2	3	0	104	
7:55 AM	10	14	2	0	1	17	7	0	12	0	10	0	4	2	1	0	80	979
8:00 AM	12	6	0	0	0	11	14	0	13	2	15	0	4	4	2	0	83	1012
8:05 AM	9	8	2	0	0	10	13	0	6	3	16	0	4	6	1	0	78	1036
8:10 AM	6	7	2	0	1	14	9	0	9	4	21	0	4	6	1	0	84	1067
8:15 AM	6	11	1	0	0	9	6	0	9	4	16	0	5	1	0	0	68	1080
8:20 AM	3	6	1	0	1	13	4	0	17	4	10	0	8	0	0	0	67	1073
8:25 AM	2	8	2	0	0	9	6	0	4	1	6	0	4	2	0	0	44	1030
8:30 AM	4	4	4	0	0	8	5	0	2	1	10	0	4	3	0	0	45	961
8:35 AM	5	4	1	0	1	10	7	0	4	1	12	0	3	1	2	0	51	900
8:40 AM	4	7	1	0	0	14	6	0	7	1	5	0	6	2	0	0	53	847
8:45 AM	4	8	2	0	0	11	2	0	4	0	10	0	6	1	2	0	50	807
8:50 AM	3	5	0	0	1	9	4	0	4	0	7	0	4	1	0	0	38	741
8:55 AM	6	6	2	0	1	8	2	0	6	0	6	0	4	0	0	0	41	702

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	68	192	28	0	8	444	84	0	92	24	200	0	176	12	0	0	1328
Heavy Trucks	4	12	0		0	12	4		4	4	4		0	0	0		44
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

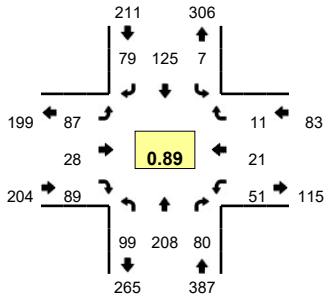
LOCATION: 29. Taylor Rd -- English Colony Way/Rock Springs Rd

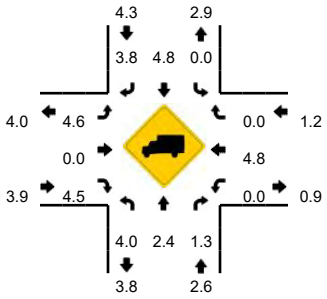
QC JOB #: 14812811

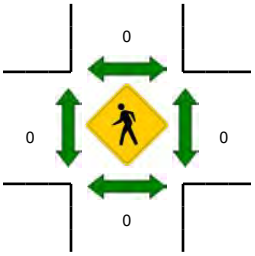
CITY/STATE: Loomis, CA

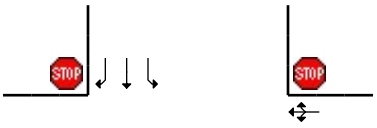
DATE: Wed, Oct 10 2018

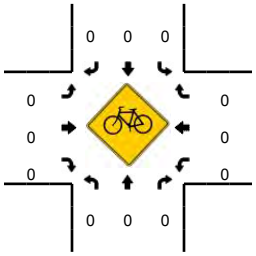
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

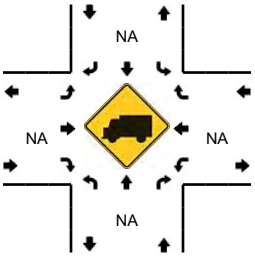


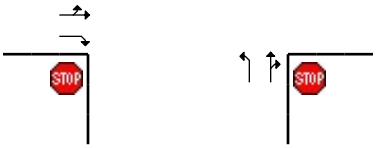


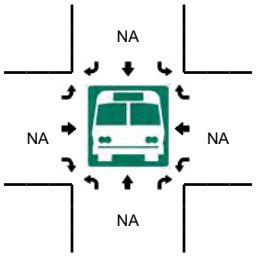












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				English Colony Way/Rock Springs Rd (Eastbound)				English Colony Way/Rock Springs Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	12	19	3	0	1	6	6	0	9	3	6	0	2	2	1	0	70	
4:05 PM	8	14	9	0	0	6	3	0	10	3	6	0	2	1	0	0	62	
4:10 PM	6	20	8	0	2	12	9	0	10	0	10	0	5	3	1	0	86	
4:15 PM	5	16	11	0	0	10	5	0	8	5	9	0	2	0	0	0	71	
4:20 PM	8	11	3	0	1	7	7	0	3	3	6	0	1	1	0	0	51	
4:25 PM	10	22	2	0	1	9	5	0	5	1	9	0	2	1	2	0	69	
4:30 PM	15	17	5	0	0	6	6	0	7	2	5	0	2	1	3	0	69	
4:35 PM	2	19	3	0	0	11	9	0	6	2	8	0	4	0	1	0	65	
4:40 PM	13	15	8	0	0	10	9	0	11	2	10	0	2	3	1	0	84	
4:45 PM	8	18	9	0	0	15	10	0	7	2	6	0	2	1	0	0	78	
4:50 PM	6	16	8	0	1	10	6	0	9	0	5	0	8	1	1	0	71	
4:55 PM	8	10	4	0	0	9	9	0	7	3	5	0	6	1	3	0	65	841
5:00 PM	6	12	4	0	0	11	5	0	5	0	12	0	4	3	1	0	63	834
5:05 PM	9	19	4	0	2	10	1	0	11	4	9	0	3	2	1	0	75	847
5:10 PM	6	16	3	0	0	11	7	0	3	3	6	0	8	3	0	0	66	827
5:15 PM	10	16	12	0	0	18	7	0	7	2	8	0	4	4	0	0	88	844
5:20 PM	11	25	10	0	2	8	4	0	5	1	7	0	4	1	0	0	78	871
5:25 PM	5	25	10	0	2	6	6	0	9	7	8	0	4	1	0	0	83	885
5:30 PM	9	16	10	0	0	4	3	0	7	3	9	0	3	1	1	0	66	882
5:35 PM	6	20	6	0	1	11	1	0	5	2	3	0	2	0	0	0	57	874
5:40 PM	7	18	6	0	0	9	8	0	10	4	9	0	2	3	0	0	76	866
5:45 PM	6	21	6	0	0	4	2	0	6	3	6	0	4	5	1	0	64	852
5:50 PM	10	17	6	0	0	10	6	0	8	0	7	0	4	1	0	0	69	850
5:55 PM	8	17	6	0	0	11	5	0	2	0	7	0	2	1	1	0	60	845

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	264	128	0	16	128	68	0	84	40	92	0	48	24	0	0	996
Heavy Trucks	4	0	0		0	4	0		4	0	4		0	4	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

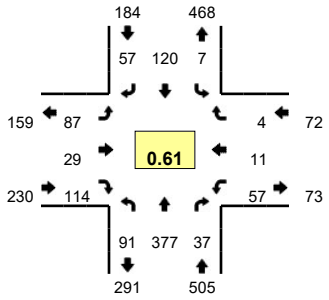
LOCATION: 29. Taylor Rd -- English Colony Way/Rock Springs Rd

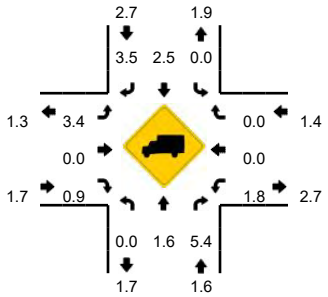
QC JOB #: 14812812

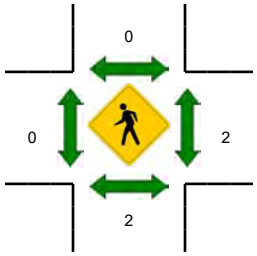
CITY/STATE: Loomis, CA

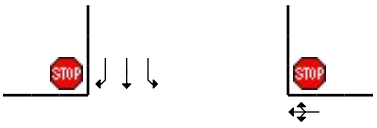
DATE: Sat, Oct 13 2018

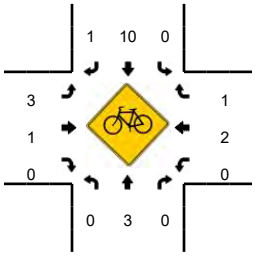
Peak-Hour: 11:00 AM -- 12:00 PM
Peak 15-Min: 11:20 AM -- 11:35 AM

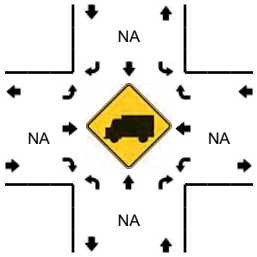


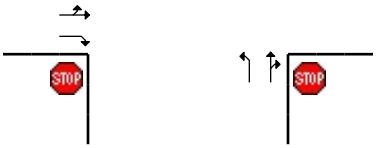


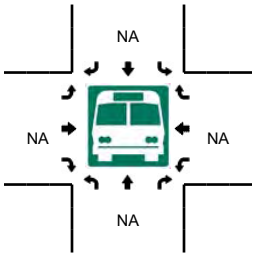












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				English Colony Way/Rock Springs Rd (Eastbound)				English Colony Way/Rock Springs Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	8	15	6	0	0	8	4	0	9	5	14	0	5	1	0	0	75	
11:05 AM	9	3	4	0	1	9	5	0	10	2	9	0	7	1	1	0	61	
11:10 AM	6	18	2	0	1	9	2	0	17	5	17	0	3	0	0	0	80	
11:15 AM	3	29	2	0	2	9	3	0	7	4	8	0	2	0	0	0	69	
11:20 AM	4	92	3	0	2	9	11	0	13	3	11	0	7	1	0	0	156	
11:25 AM	10	131	1	0	0	13	2	0	4	1	11	0	4	1	1	0	179	
11:30 AM	8	26	1	0	0	8	6	0	8	1	8	0	5	2	0	0	73	
11:35 AM	8	14	3	0	1	14	5	0	6	4	9	0	7	1	1	0	73	
11:40 AM	12	16	3	0	0	13	7	0	4	0	7	0	6	0	0	0	68	
11:45 AM	7	12	2	0	0	9	3	0	4	1	5	0	2	3	1	0	49	
11:50 AM	9	12	5	0	0	14	4	0	2	2	7	0	4	0	0	0	59	
11:55 AM	7	9	5	0	0	5	5	0	3	1	8	0	5	1	0	0	49	991
12:00 PM	12	11	5	0	2	9	6	0	2	0	9	0	3	0	0	0	59	975
12:05 PM	5	10	3	0	0	11	4	0	3	2	6	0	2	2	1	0	49	963
12:10 PM	10	15	5	0	0	9	5	0	6	0	7	0	1	3	0	0	61	944
12:15 PM	10	12	5	0	1	7	5	0	4	2	7	0	4	0	0	0	57	932
12:20 PM	5	11	2	0	0	9	11	0	7	0	3	0	3	0	0	0	51	827
12:25 PM	2	7	4	0	5	7	0	0	9	1	7	0	3	1	0	0	46	694
12:30 PM	3	14	1	0	2	20	6	0	6	0	10	0	3	2	2	0	69	690
12:35 PM	9	8	3	0	0	12	4	0	2	1	8	0	6	2	0	0	55	672
12:40 PM	4	5	6	0	0	8	5	0	4	0	10	0	3	2	2	0	49	653
12:45 PM	7	13	2	0	0	8	8	0	0	0	6	0	2	0	0	0	46	650
12:50 PM	7	24	5	0	0	16	8	0	3	2	7	0	0	2	1	0	75	666
12:55 PM	9	9	4	0	0	5	7	0	4	1	8	0	4	0	1	0	52	669

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	88	996	20	0	8	120	76	0	100	20	120	0	64	16	4	0	1632
Heavy Trucks	0	8	4		0	4	0		4	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	1		0	1	0		0	2	0		4
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

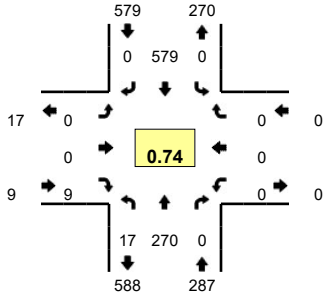
Type of peak hour being reported: Intersection Peak

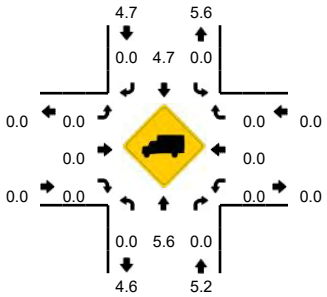
Method for determining peak hour: Total Entering Volume

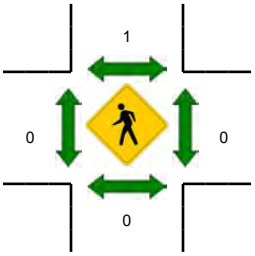
LOCATION: 30. Taylor Rd -- Penryn Rd (North)
CITY/STATE: Penryn, CA

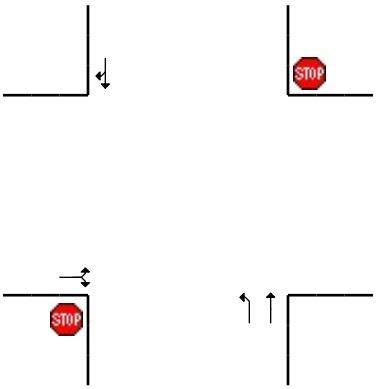
QC JOB #: 14812848
DATE: Wed, Oct 10 2018

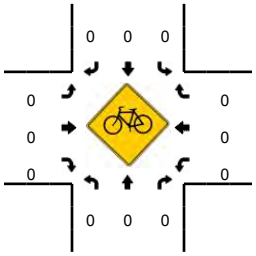
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

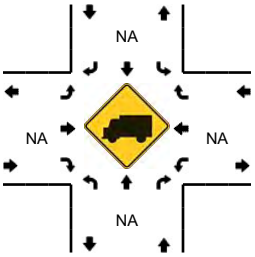


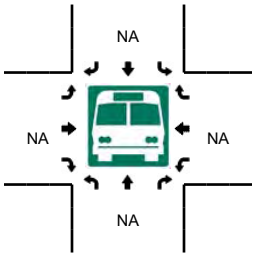












5-Min Count Period Beginning At	30. Taylor Rd (Northbound)				30. Taylor Rd (Southbound)				Penryn Rd (North) (Eastbound)				Penryn Rd (North) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	7	0	0	0	39	0	0	0	0	0	0	0	0	0	0	46	
7:05 AM	1	15	0	0	0	23	0	0	0	0	0	0	0	0	0	0	39	
7:10 AM	2	12	0	0	0	30	0	0	0	0	1	0	0	0	0	0	45	
7:15 AM	1	12	0	0	0	38	0	0	0	0	0	0	0	0	0	0	51	
7:20 AM	0	13	0	0	0	51	0	0	0	0	0	0	0	0	0	0	64	
7:25 AM	0	19	0	0	0	64	0	0	0	0	3	0	0	0	0	0	86	
7:30 AM	7	21	0	0	0	82	0	0	0	0	0	0	0	0	0	0	110	
7:35 AM	1	26	0	0	0	57	0	0	0	0	3	0	0	0	0	0	87	
7:40 AM	1	26	0	0	0	73	0	0	0	0	0	0	0	0	0	0	100	
7:45 AM	3	39	0	0	0	45	0	0	0	0	1	0	0	0	0	0	88	
7:50 AM	2	26	0	0	0	39	0	0	0	0	2	0	0	0	0	0	69	
7:55 AM	3	29	0	0	0	30	0	0	0	0	0	0	0	0	0	0	62	847
8:00 AM	0	19	0	0	0	28	0	0	0	0	0	0	0	0	0	0	47	848
8:05 AM	0	17	0	0	0	36	0	0	0	0	0	0	0	0	0	0	53	862
8:10 AM	0	17	0	0	0	36	0	0	0	0	0	0	0	0	0	0	53	870
8:15 AM	0	18	0	0	0	38	0	0	0	0	0	0	0	0	0	0	56	875
8:20 AM	0	8	0	0	0	26	0	0	0	0	0	0	0	0	0	0	34	845
8:25 AM	1	12	0	0	0	25	0	0	0	0	0	0	0	0	0	0	38	797
8:30 AM	1	13	0	0	0	21	0	0	0	0	0	0	0	0	0	0	35	722
8:35 AM	2	12	0	0	0	26	0	0	0	0	0	0	0	0	0	0	40	675
8:40 AM	1	13	0	0	0	23	0	0	0	0	1	0	0	0	0	0	38	613
8:45 AM	2	14	0	0	0	34	0	0	0	0	1	0	0	0	0	0	51	576
8:50 AM	0	8	0	0	0	23	0	0	0	0	0	0	0	0	0	0	31	538
8:55 AM	1	13	0	0	0	18	0	0	0	0	0	0	0	0	0	0	32	508

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	292	0	0	0	848	0	0	0	0	12	0	0	0	0	0	1188
Heavy Trucks	0	12	0		0	20	0		0	0	0		0	0	0		32
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/15/2018 7:08 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

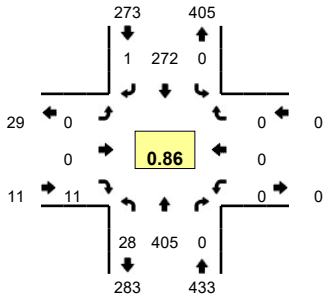
Type of peak hour being reported: Intersection Peak

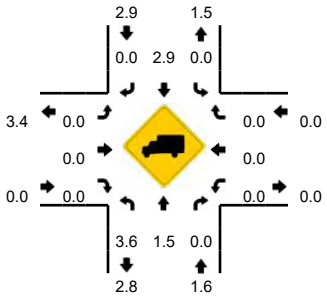
Method for determining peak hour: Total Entering Volume

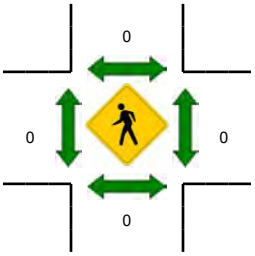
LOCATION: 30. Taylor Rd -- Penryn Rd (North)
CITY/STATE: Penryn, CA

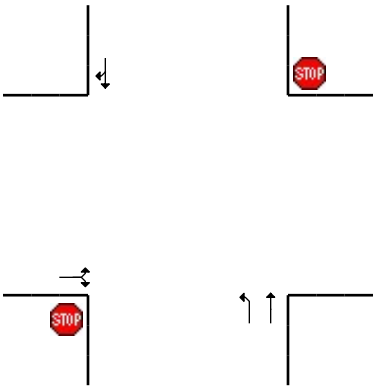
QC JOB #: 14812849
DATE: Wed, Oct 10 2018

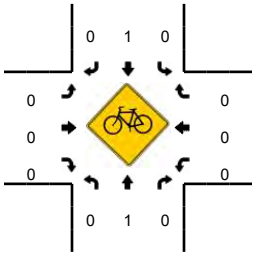
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

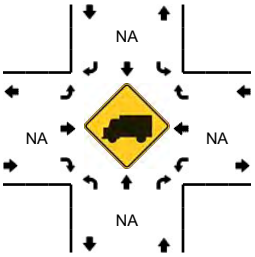


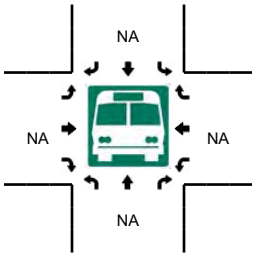












5-Min Count Period Beginning At	30. Taylor Rd (Northbound)				30. Taylor Rd (Southbound)				Penryn Rd (North) (Eastbound)				Penryn Rd (North) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	30	0	0	0	16	0	0	0	0	0	0	0	0	0	0	46	
4:05 PM	2	32	0	0	0	18	0	0	0	0	0	0	0	0	0	0	52	
4:10 PM	0	38	0	0	0	26	0	0	0	0	0	0	0	0	0	0	64	
4:15 PM	2	29	0	0	0	23	0	0	0	0	0	0	0	0	0	0	54	
4:20 PM	2	25	0	0	0	12	0	0	0	0	1	0	0	0	0	0	40	
4:25 PM	3	39	0	0	0	22	0	0	0	0	2	0	0	0	0	0	66	
4:30 PM	9	33	0	0	0	13	0	0	0	0	1	0	0	0	0	0	56	
4:35 PM	1	26	0	0	0	18	0	0	0	0	1	0	0	0	0	0	46	
4:40 PM	2	36	0	0	0	29	0	0	0	0	0	0	0	0	0	0	67	
4:45 PM	0	38	0	0	0	14	0	0	0	0	0	0	0	0	0	0	52	
4:50 PM	2	31	0	0	0	26	0	0	0	0	0	0	0	0	0	0	59	
4:55 PM	5	21	0	0	0	26	0	0	0	0	0	0	0	0	0	0	52	654
5:00 PM	1	26	0	0	0	22	0	0	0	0	1	0	0	0	0	0	50	658
5:05 PM	0	35	0	0	0	28	1	0	0	0	2	0	0	0	0	0	66	672
5:10 PM	6	27	0	0	0	20	0	0	0	0	1	0	0	0	0	0	54	662
5:15 PM	4	39	0	0	0	25	0	0	0	0	0	0	0	0	0	0	68	676
5:20 PM	2	48	0	0	0	26	0	0	0	0	4	0	0	0	0	0	80	716
5:25 PM	2	38	0	0	0	20	0	0	0	0	0	0	0	0	0	0	60	710
5:30 PM	2	30	0	0	0	16	0	0	0	0	3	0	0	0	0	0	51	705
5:35 PM	2	36	0	0	0	20	0	0	0	0	0	0	0	0	0	0	58	717
5:40 PM	4	30	0	0	0	20	0	0	0	0	0	0	0	0	0	0	54	704
5:45 PM	1	39	0	0	0	15	0	0	0	0	1	0	0	0	0	0	56	708
5:50 PM	1	25	0	0	0	23	0	0	0	0	2	0	0	0	0	0	51	700
5:55 PM	1	38	0	0	0	14	0	0	0	0	1	0	0	0	0	0	54	702

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	500	0	0	0	284	0	0	0	0	16	0	0	0	0	0	832
Heavy Trucks	0	4	0		0	4	0		0	0	0		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/15/2018 7:08 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

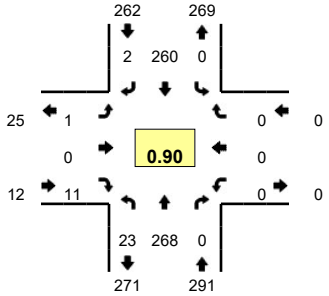
Type of peak hour being reported: Intersection Peak

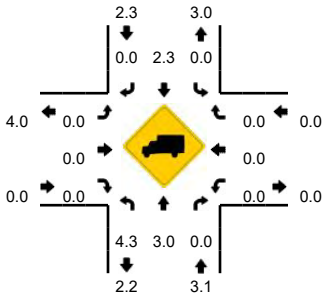
Method for determining peak hour: Total Entering Volume

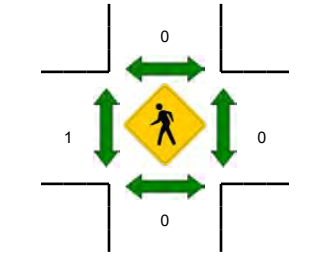
LOCATION: 30. Taylor Rd -- Penryn Rd (North)
CITY/STATE: Penryn, CA

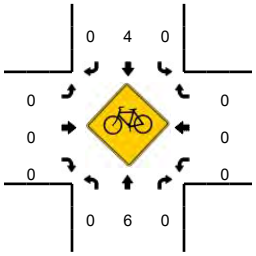
QC JOB #: 14812850
DATE: Sat, Oct 27 2018

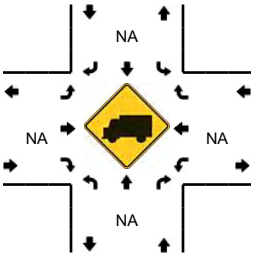
Peak-Hour: 11:25 AM -- 12:25 PM
Peak 15-Min: 12:10 PM -- 12:25 PM

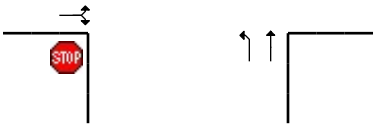


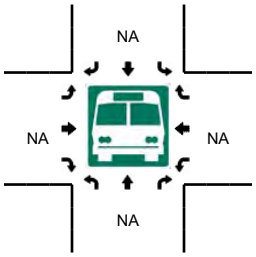












5-Min Count Period Beginning At	30. Taylor Rd (Northbound)				30. Taylor Rd (Southbound)				Penryn Rd (North) (Eastbound)				Penryn Rd (North) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	2	25	0	0	0	12	0	0	0	0	0	0	0	0	0	0	39	
11:05 AM	1	23	0	0	0	22	0	0	0	0	0	0	0	0	0	0	46	
11:10 AM	1	19	0	0	0	28	0	0	0	0	1	0	0	0	0	0	49	
11:15 AM	1	15	0	0	0	14	0	0	0	0	2	0	0	0	0	0	32	
11:20 AM	3	23	0	0	0	20	0	0	0	0	0	0	0	0	0	0	46	
11:25 AM	2	28	0	0	0	22	0	0	0	0	2	0	0	0	0	0	54	
11:30 AM	1	20	0	0	0	23	0	0	0	0	0	0	0	0	0	0	44	
11:35 AM	1	15	0	0	0	22	0	0	0	0	1	0	0	0	0	0	39	
11:40 AM	1	18	0	0	0	22	1	0	1	0	0	0	0	0	0	0	43	
11:45 AM	3	22	0	0	0	29	0	0	0	0	1	0	0	0	0	0	55	
11:50 AM	1	23	0	0	0	16	0	0	0	0	0	0	0	0	0	0	40	
11:55 AM	7	26	0	0	0	11	0	0	0	0	0	0	0	0	0	0	44	531
12:00 PM	1	26	0	0	0	22	0	0	0	0	3	0	0	0	0	0	52	544
12:05 PM	2	19	0	0	0	13	0	0	0	0	3	0	0	0	0	0	37	535
12:10 PM	1	26	0	0	0	17	0	0	0	0	0	0	0	0	0	0	44	530
12:15 PM	0	22	0	0	0	36	0	0	0	0	0	0	0	0	0	0	58	556
12:20 PM	3	23	0	0	0	27	1	0	0	0	1	0	0	0	0	0	55	565
12:25 PM	0	24	0	0	0	14	1	0	0	0	1	0	0	0	0	0	40	551
12:30 PM	1	18	0	0	0	21	0	0	0	0	4	0	0	0	0	0	44	551
12:35 PM	0	23	0	0	0	21	0	0	0	0	0	0	0	0	0	0	44	556
12:40 PM	2	20	0	0	0	23	0	0	0	0	0	0	0	0	0	0	45	558
12:45 PM	0	22	0	0	0	18	0	0	0	0	0	0	0	0	0	0	40	543
12:50 PM	4	27	0	0	0	21	0	1	0	0	0	0	0	0	0	0	53	556
12:55 PM	2	27	0	0	0	22	0	0	0	0	0	0	0	0	0	0	51	563

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	284	0	0	0	320	4	0	0	0	4	0	0	0	0	0	628
Heavy Trucks	4	8	0		0	4	0		0	0	0		0	0	0		16
Pedestrians		0				0				4				0			4
Bicycles	0	2	0		0	2	0		0	0	0		0	0	0		4
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/15/2018 7:08 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

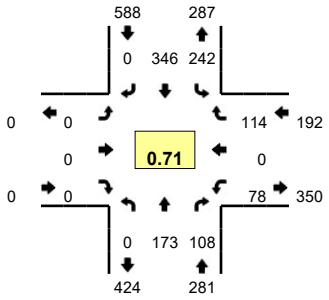
Type of peak hour being reported: Intersection Peak

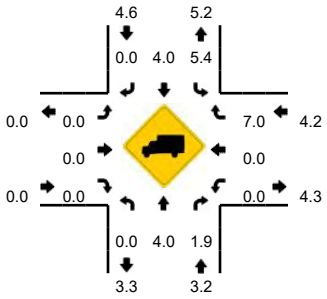
Method for determining peak hour: Total Entering Volume

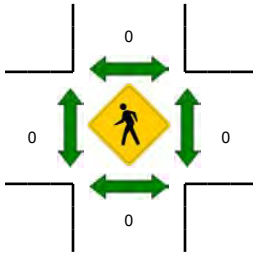
LOCATION: 30. Taylor Rd -- Penryn Rd (South)
CITY/STATE: Penryn, CA

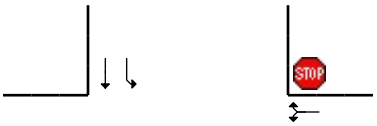
QC JOB #: 14812851
DATE: Wed, Oct 10 2018

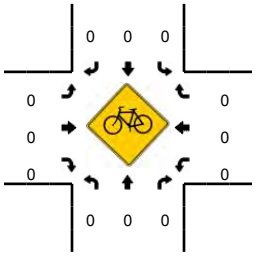
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

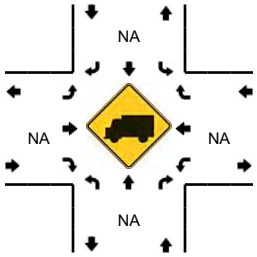


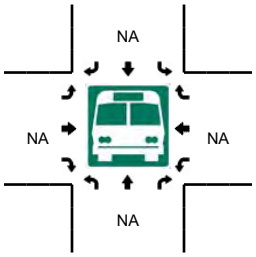












5-Min Count Period Beginning At	30. Taylor Rd (Northbound)				30. Taylor Rd (Southbound)				Penryn Rd (South) (Eastbound)				Penryn Rd (South) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	4	3	0	16	23	0	0	0	0	0	0	2	0	3	0	51	
7:05 AM	0	11	5	0	14	9	0	0	0	0	0	0	5	0	5	0	49	
7:10 AM	0	10	5	0	13	18	0	0	0	0	0	0	6	0	4	0	56	
7:15 AM	0	9	1	0	17	21	0	0	0	0	0	0	5	0	4	0	57	
7:20 AM	0	8	3	0	20	31	0	0	0	0	0	0	7	0	5	0	74	
7:25 AM	0	14	16	0	12	55	0	0	0	0	0	0	10	0	5	0	112	
7:30 AM	0	14	13	0	18	64	0	0	0	0	0	0	13	0	14	0	136	
7:35 AM	0	22	21	0	19	41	0	0	0	0	0	0	6	0	5	0	114	
7:40 AM	0	19	14	0	28	45	0	0	0	0	0	0	12	0	8	0	126	
7:45 AM	0	27	16	0	21	25	0	0	0	0	0	0	11	0	15	0	115	
7:50 AM	0	19	16	0	25	16	0	0	0	0	0	0	7	0	9	0	92	
7:55 AM	0	14	5	0	20	10	0	0	0	0	0	0	0	0	18	0	67	1049
8:00 AM	0	8	1	0	14	14	0	0	0	0	0	0	2	0	11	0	50	1048
8:05 AM	0	9	1	0	19	17	0	0	0	0	0	0	3	0	8	0	57	1056
8:10 AM	0	8	2	0	26	10	0	0	0	0	0	0	2	0	9	0	57	1057
8:15 AM	0	11	0	0	20	18	0	0	0	0	0	0	5	0	7	0	61	1061
8:20 AM	0	5	1	0	11	15	0	0	0	0	0	0	4	0	3	0	39	1026
8:25 AM	0	8	2	0	14	11	0	0	0	0	0	0	5	0	5	0	45	959
8:30 AM	0	5	2	0	12	9	0	0	0	0	0	0	2	0	9	0	39	862
8:35 AM	0	5	3	0	14	12	0	0	0	0	0	0	2	0	9	0	45	793
8:40 AM	0	7	2	0	14	10	0	0	0	0	0	0	1	0	7	0	41	708
8:45 AM	0	8	0	0	21	14	0	0	0	0	0	0	2	0	8	0	53	646
8:50 AM	0	6	2	0	14	9	0	0	0	0	0	0	0	0	2	0	33	587
8:55 AM	0	8	1	0	9	9	0	0	0	0	0	0	1	0	6	0	34	554

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	220	192	0	260	600	0	0	0	0	0	0	124	0	108	0	1504
Heavy Trucks	0	4	4		8	12	0		0	0	0		0	0	8		36
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/15/2018 7:08 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

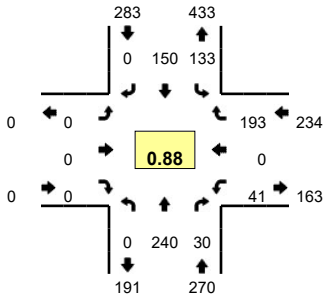
Type of peak hour being reported: Intersection Peak

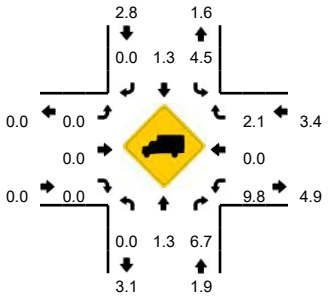
Method for determining peak hour: Total Entering Volume

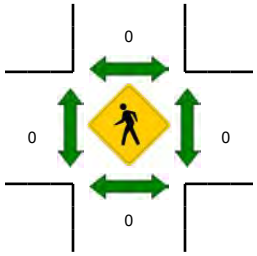
LOCATION: 30. Taylor Rd -- Penryn Rd (South)
CITY/STATE: Penryn, CA

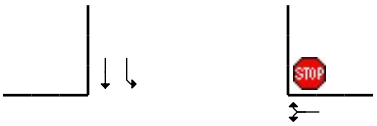
QC JOB #: 14812852
DATE: Wed, Oct 10 2018

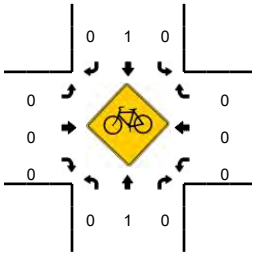
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

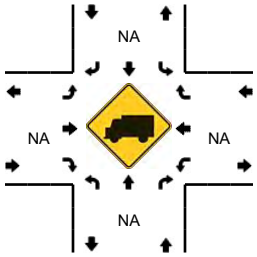


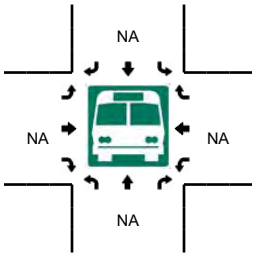












5-Min Count Period Beginning At	30. Taylor Rd (Northbound)				30. Taylor Rd (Southbound)				Penryn Rd (South) (Eastbound)				Penryn Rd (South) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	19	3	0	6	10	0	0	0	0	0	0	1	0	11	0	50	
4:05 PM	0	9	0	0	7	11	0	0	0	0	0	0	1	0	25	0	53	
4:10 PM	0	19	0	0	13	13	0	0	0	0	0	0	2	0	19	0	66	
4:15 PM	0	15	4	0	15	8	0	0	0	0	0	0	4	0	16	0	62	
4:20 PM	0	10	3	0	7	6	0	0	0	0	0	0	2	0	17	0	45	
4:25 PM	0	24	3	0	12	12	0	0	0	0	0	0	2	0	18	0	71	
4:30 PM	0	14	0	0	7	7	0	0	0	0	0	0	5	0	28	1	62	
4:35 PM	0	21	1	0	10	9	0	0	0	0	0	0	1	0	6	0	48	
4:40 PM	0	20	2	0	16	13	0	0	0	0	0	0	4	0	18	0	73	
4:45 PM	0	21	4	0	5	9	0	0	0	0	0	0	3	0	17	0	59	
4:50 PM	0	20	1	0	12	14	0	0	0	0	0	0	5	0	13	0	65	
4:55 PM	0	7	6	0	14	12	0	0	0	0	0	0	1	0	19	0	59	713
5:00 PM	0	14	2	0	9	14	0	0	0	0	0	0	4	0	13	0	56	719
5:05 PM	0	22	0	0	15	15	0	0	0	0	0	0	2	0	13	0	67	733
5:10 PM	0	19	1	0	8	13	0	0	0	0	0	0	4	0	14	0	59	726
5:15 PM	0	22	2	0	8	17	0	0	0	0	0	0	4	0	21	0	74	738
5:20 PM	0	31	1	0	20	10	0	0	0	0	0	0	4	0	19	0	85	778
5:25 PM	0	19	2	0	9	11	0	0	0	0	0	0	3	0	21	0	65	772
5:30 PM	0	21	4	0	9	10	0	0	0	0	0	0	4	0	11	0	59	769
5:35 PM	0	24	5	0	8	12	0	0	0	0	0	0	3	0	14	0	66	787
5:40 PM	0	19	5	0	11	9	0	0	0	0	0	0	1	0	15	0	60	774
5:45 PM	0	18	4	0	8	8	0	0	0	0	0	0	1	0	22	0	61	776
5:50 PM	0	19	3	0	14	11	0	0	0	0	0	0	2	0	7	0	56	767
5:55 PM	0	21	4	0	5	10	0	0	0	0	0	0	1	0	18	0	59	767

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	288	20	0	148	152	0	0	0	0	0	0	44	0	244	0	896
Heavy Trucks	0	4	0		4	0	0		0	0	0		4	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/15/2018 7:08 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

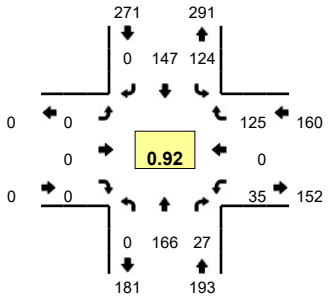
Type of peak hour being reported: Intersection Peak

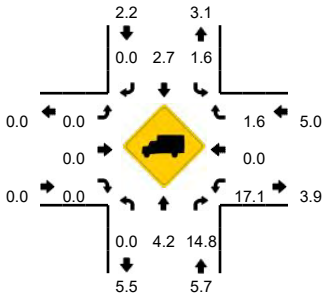
Method for determining peak hour: Total Entering Volume

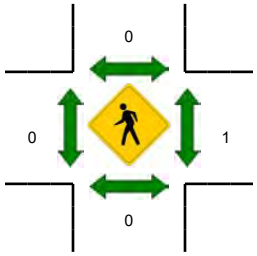
LOCATION: 30. Taylor Rd -- Penryn Rd (South)
CITY/STATE: Penryn, CA

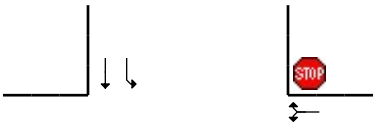
QC JOB #: 14812853
DATE: Sat, Oct 27 2018

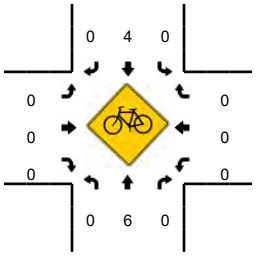
Peak-Hour: 11:25 AM -- 12:25 PM
Peak 15-Min: 12:10 PM -- 12:25 PM

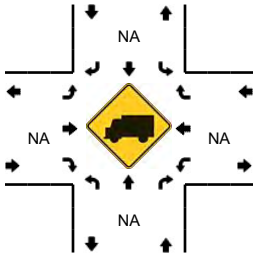


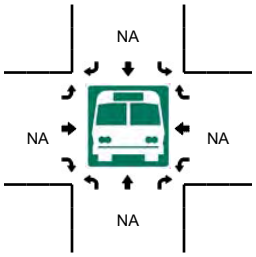












5-Min Count Period Beginning At	30. Taylor Rd (Northbound)				30. Taylor Rd (Southbound)				Penryn Rd (South) (Eastbound)				Penryn Rd (South) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	17	5	0	5	7	0	0	0	0	0	0	3	0	10	0	47	
11:05 AM	0	15	2	0	8	14	0	0	0	0	0	0	3	0	9	0	51	
11:10 AM	0	12	3	0	11	18	0	0	0	0	0	0	1	0	8	0	53	
11:15 AM	0	9	1	0	6	10	0	0	0	0	0	0	0	0	7	0	33	
11:20 AM	0	8	2	0	12	8	0	0	0	0	0	0	3	0	18	0	51	
11:25 AM	0	12	3	0	13	11	0	0	0	0	0	0	3	0	18	0	60	
11:30 AM	0	9	3	0	14	9	0	0	0	0	0	0	3	0	12	0	50	
11:35 AM	0	11	1	0	11	12	0	0	0	0	0	0	4	0	5	0	44	
11:40 AM	0	11	4	0	8	14	0	0	0	0	0	0	3	0	8	1	49	
11:45 AM	0	10	0	0	10	20	0	0	0	0	0	0	5	0	15	0	60	
11:50 AM	0	17	3	0	8	8	0	0	0	0	0	0	1	0	7	0	44	
11:55 AM	0	16	0	0	3	8	0	0	0	0	0	0	4	0	17	0	48	590
12:00 PM	0	15	2	0	12	13	0	0	0	0	0	0	1	0	12	0	55	598
12:05 PM	0	13	3	0	5	11	0	0	0	0	0	0	4	0	8	0	44	591
12:10 PM	0	18	4	0	6	11	0	0	0	0	0	0	1	0	9	0	49	587
12:15 PM	0	15	2	0	18	18	0	0	0	0	0	0	0	0	7	0	60	614
12:20 PM	0	19	2	0	16	12	0	0	0	0	0	0	5	0	7	0	61	624
12:25 PM	0	13	0	0	6	9	0	0	0	0	0	0	0	0	11	0	39	603
12:30 PM	0	10	2	0	15	10	0	0	0	0	0	0	2	0	9	0	48	601
12:35 PM	0	13	5	0	5	16	0	0	0	0	0	0	1	0	10	0	50	607
12:40 PM	0	16	2	0	11	12	0	0	0	0	0	0	1	0	6	0	48	606
12:45 PM	0	13	3	0	10	8	0	0	0	0	0	0	2	0	9	0	45	591
12:50 PM	0	9	1	0	10	11	0	0	0	0	0	0	9	0	22	0	62	609
12:55 PM	0	18	0	0	10	12	0	0	0	0	0	0	1	0	11	0	52	613

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	208	32	0	160	164	0	0	0	0	0	0	24	0	92	0	680
Heavy Trucks	0	8	0		0	4	0		0	0	0		12	0	4		28
Pedestrians		0				0				0				0			0
Bicycles	0	2	0		0	2	0		0	0	0		0	0	0		4
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/15/2018 7:08 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

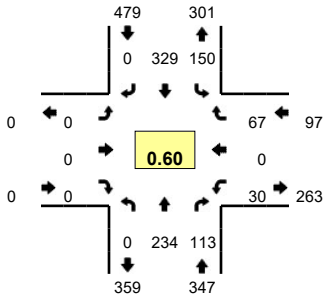
LOCATION: 29. Taylor Rd -- Del Oro High School North Lot

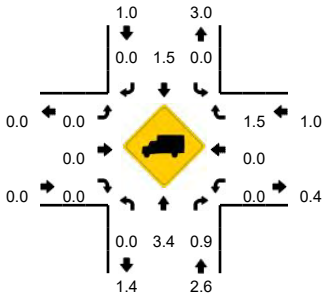
CITY/STATE: Loomis, CA

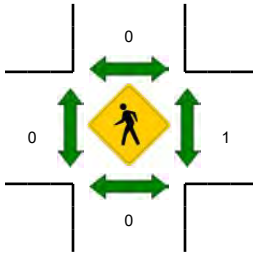
QC JOB #: 14812816

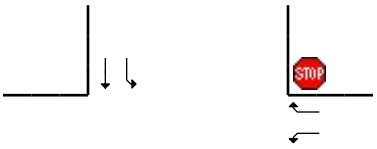
DATE: Wed, Oct 10 2018

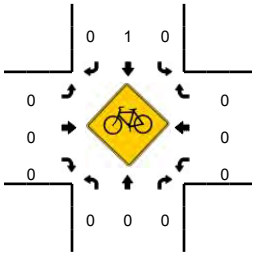
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

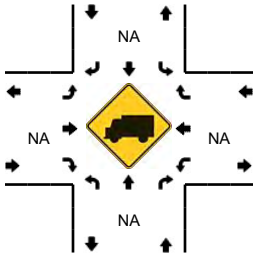


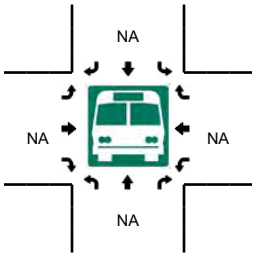












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School North Lot (Eastbound)				Del Oro High School North Lot (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	5	6	0	4	17	0	0	0	0	0	0	1	0	2	0	35	
7:05 AM	0	11	7	0	2	16	0	0	0	0	0	0	0	0	2	0	38	
7:10 AM	0	17	2	0	6	15	0	0	0	0	0	0	0	0	0	0	40	
7:15 AM	0	10	3	0	4	22	0	0	0	0	0	0	1	0	0	0	40	
7:20 AM	0	15	23	0	6	24	0	0	0	0	0	0	1	0	1	0	70	
7:25 AM	0	20	22	0	21	39	0	0	0	0	0	0	4	0	10	0	116	
7:30 AM	0	22	19	0	34	37	0	0	0	0	0	0	6	0	10	0	128	
7:35 AM	0	29	15	0	32	41	0	0	0	0	0	0	4	0	17	0	138	
7:40 AM	0	27	9	0	16	48	0	0	0	0	0	0	5	0	8	0	113	
7:45 AM	0	34	5	0	21	22	0	0	0	0	0	0	4	0	15	0	101	
7:50 AM	0	31	2	0	3	33	0	0	0	0	0	0	4	0	2	0	75	
7:55 AM	0	13	0	0	1	15	0	0	0	0	0	0	0	0	0	0	29	923
8:00 AM	0	7	0	0	0	14	0	0	0	0	0	0	2	0	0	0	23	911
8:05 AM	0	16	0	0	2	19	0	0	0	0	0	0	1	0	0	0	38	911
8:10 AM	0	12	0	0	1	18	0	0	0	0	0	0	0	0	0	0	31	902
8:15 AM	0	14	0	0	1	16	0	0	0	0	0	0	1	0	0	0	32	894
8:20 AM	0	7	0	0	0	18	0	0	0	0	0	0	2	0	0	0	27	851
8:25 AM	0	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	24	759
8:30 AM	0	11	1	0	0	12	0	0	0	0	0	0	0	0	0	0	24	655
8:35 AM	0	9	1	0	0	12	0	0	0	0	0	0	1	0	0	0	23	540
8:40 AM	0	9	1	0	0	16	0	0	0	0	0	0	0	0	0	0	26	453
8:45 AM	0	8	3	0	0	9	0	0	0	0	0	0	1	0	0	0	21	373
8:50 AM	0	6	0	0	0	17	0	0	0	0	0	0	0	0	0	0	23	321
8:55 AM	0	13	1	0	1	9	0	0	0	0	0	0	0	0	0	0	24	316

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	284	224	0	348	468	0	0	0	0	0	0	56	0	148	0	1528
Heavy Trucks	0	0	4		0	12	0		0	0	0		0	0	4		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

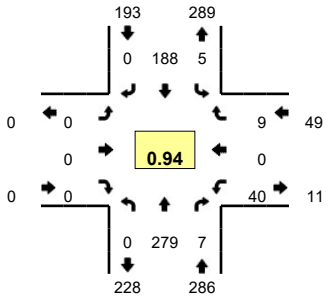
LOCATION: 29. Taylor Rd -- Del Oro High School North Lot

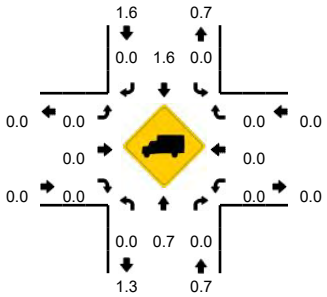
QC JOB #: 14812817

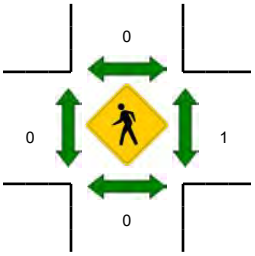
CITY/STATE: Loomis, CA

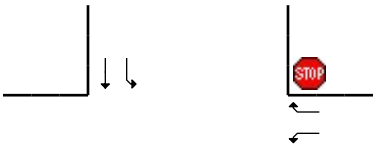
DATE: Wed, Oct 10 2018

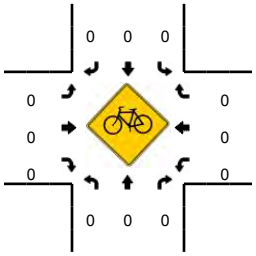
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

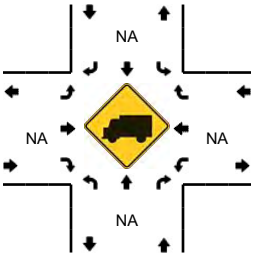


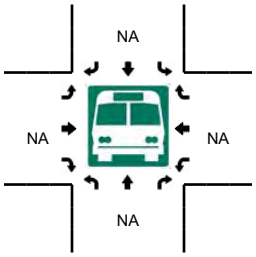












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School North Lot (Eastbound)				Del Oro High School North Lot (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	21	0	0	0	13	0	0	0	0	0	0	3	0	0	0	37	
4:05 PM	0	15	0	0	0	17	0	0	0	0	0	0	1	0	1	0	34	
4:10 PM	0	20	3	0	0	10	0	0	0	0	0	0	1	0	0	0	34	
4:15 PM	0	22	1	0	0	18	0	0	0	0	0	0	2	0	1	0	44	
4:20 PM	0	23	0	0	0	13	0	0	0	0	0	0	1	0	0	0	37	
4:25 PM	0	23	0	0	0	15	0	0	0	0	0	0	1	0	0	0	39	
4:30 PM	0	13	0	0	0	11	0	0	0	0	0	0	0	0	1	0	25	
4:35 PM	0	29	1	0	0	15	0	0	0	0	0	0	0	0	0	0	45	
4:40 PM	0	22	0	0	0	20	0	0	0	0	0	0	0	0	0	0	42	
4:45 PM	0	28	0	0	1	18	0	0	0	0	0	0	2	0	1	0	50	
4:50 PM	0	21	0	0	1	15	0	0	0	0	0	0	0	0	0	0	37	
4:55 PM	0	15	0	0	0	22	0	0	0	0	0	0	0	0	1	0	38	462
5:00 PM	0	13	0	0	0	17	0	0	0	0	0	0	0	0	0	0	30	455
5:05 PM	0	29	0	0	0	16	0	0	0	0	0	0	6	0	0	0	51	472
5:10 PM	0	17	0	0	1	14	0	0	0	0	0	0	2	0	0	0	34	472
5:15 PM	0	28	0	0	0	25	0	0	0	0	0	0	0	0	0	0	53	481
5:20 PM	0	28	1	0	0	20	0	0	0	0	0	0	1	0	0	0	50	494
5:25 PM	0	22	0	0	0	15	0	0	0	0	0	0	0	0	0	0	37	492
5:30 PM	0	25	0	0	0	15	0	0	0	0	0	0	3	0	0	0	43	510
5:35 PM	0	23	1	0	0	12	0	0	0	0	0	0	9	0	2	0	47	512
5:40 PM	0	22	2	0	0	13	0	0	0	0	0	0	7	0	3	0	47	517
5:45 PM	0	23	1	0	2	16	0	0	0	0	0	0	3	0	1	0	46	513
5:50 PM	0	26	1	0	1	12	0	0	0	0	0	0	4	0	1	0	45	521
5:55 PM	0	23	1	0	0	13	0	1	0	0	0	0	5	0	2	0	45	528

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	312	4	0	0	240	0	0	0	0	0	0	4	0	0	0	560
Heavy Trucks	0	0	0		0	8	0		0	0	0		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

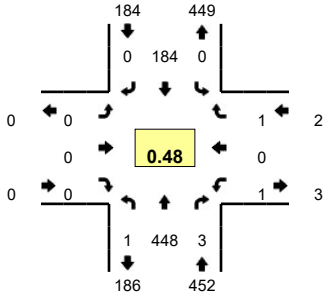
Type of peak hour being reported: Intersection Peak

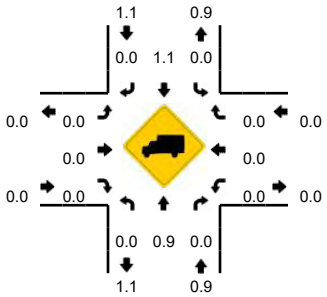
Method for determining peak hour: Total Entering Volume

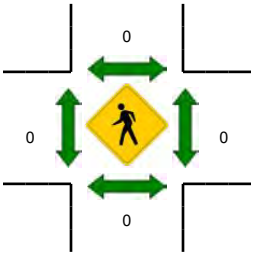
LOCATION: 29. Taylor Rd -- Del Oro High School North Lot
CITY/STATE: Loomis, CA

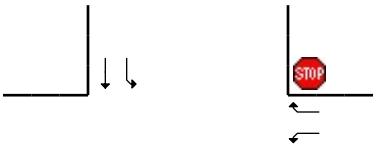
QC JOB #: 14812818
DATE: Sat, Oct 13 2018

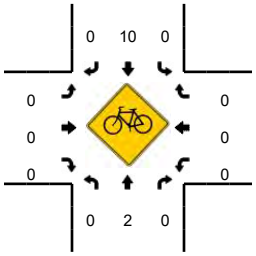
Peak-Hour: 11:05 AM -- 12:05 PM
Peak 15-Min: 11:15 AM -- 11:30 AM

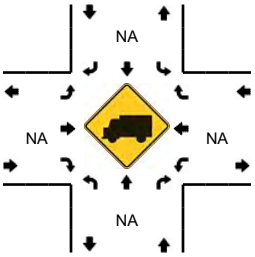


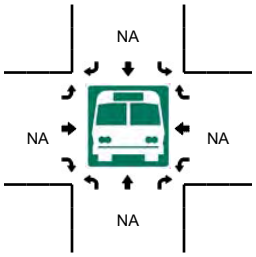












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School North Lot (Eastbound)				Del Oro High School North Lot (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	13	0	0	0	12	0	0	0	0	0	0	0	0	0	0	25	
11:05 AM	0	18	0	0	0	13	0	0	0	0	0	0	0	0	0	0	31	
11:10 AM	0	28	0	0	0	18	0	0	0	0	0	0	0	0	0	0	46	
11:15 AM	0	70	0	0	0	18	0	0	0	0	0	0	1	0	0	0	89	
11:20 AM	0	99	0	0	0	15	0	0	0	0	0	0	0	0	0	0	114	
11:25 AM	0	114	0	0	0	15	0	0	0	0	0	0	0	0	0	0	129	
11:30 AM	0	12	0	0	0	21	0	0	0	0	0	0	0	0	0	0	33	
11:35 AM	0	25	0	0	0	10	0	0	0	0	0	0	0	0	0	0	35	
11:40 AM	0	7	2	0	0	19	0	0	0	0	0	0	0	0	0	0	28	
11:45 AM	0	19	0	0	0	14	0	0	0	0	0	0	0	0	1	0	34	
11:50 AM	0	18	0	1	0	11	0	0	0	0	0	0	0	0	0	0	30	
11:55 AM	0	11	1	0	0	16	0	0	0	0	0	0	0	0	0	0	28	622
12:00 PM	0	27	0	0	0	14	0	0	0	0	0	0	0	0	0	0	41	638
12:05 PM	0	12	0	0	0	10	0	0	0	0	0	0	0	0	0	0	22	629
12:10 PM	0	20	0	0	0	14	0	0	0	0	0	0	0	0	0	0	34	617
12:15 PM	0	20	0	0	0	17	0	0	0	0	0	0	0	0	0	0	37	565
12:20 PM	0	19	0	0	0	14	0	0	0	0	0	0	0	0	0	0	33	484
12:25 PM	0	18	1	0	0	11	0	0	0	0	0	0	1	0	0	0	31	386
12:30 PM	0	16	0	0	0	15	0	0	0	0	0	0	2	0	0	0	33	386
12:35 PM	0	18	0	0	0	35	0	0	0	0	0	0	0	0	1	0	54	405
12:40 PM	0	13	1	0	0	17	0	0	0	0	0	0	0	0	1	0	32	409
12:45 PM	0	33	0	0	0	15	0	0	0	0	0	0	0	0	0	0	48	423
12:50 PM	0	21	0	0	0	18	0	0	0	0	0	0	0	0	0	0	39	432
12:55 PM	0	12	0	0	0	12	0	0	0	0	0	0	0	0	0	0	24	428

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1132	0	0	0	192	0	0	0	0	0	0	4	0	0	0	1328
Heavy Trucks	0	8	0		0	0	0		0	0	0		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

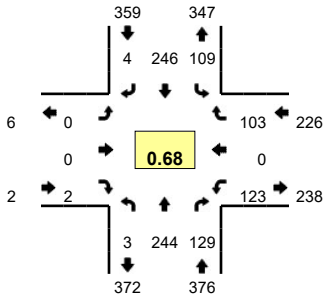
Type of peak hour being reported: Intersection Peak

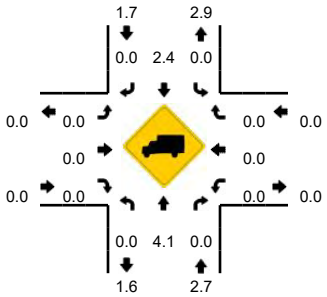
Method for determining peak hour: Total Entering Volume

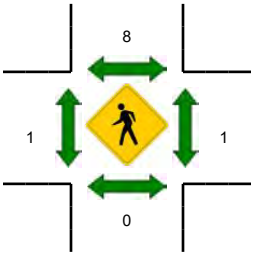
LOCATION: 29. Taylor Rd -- Del Oro High School Drop Off
CITY/STATE: Loomis, CA

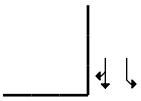
QC JOB #: 14812819
DATE: Wed, Oct 10 2018

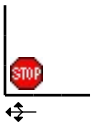
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

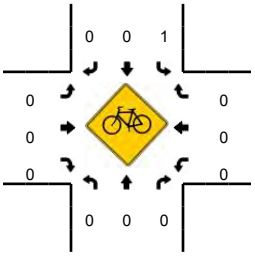


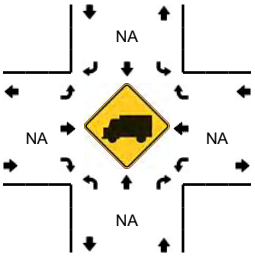


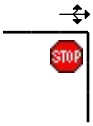


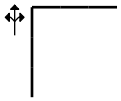


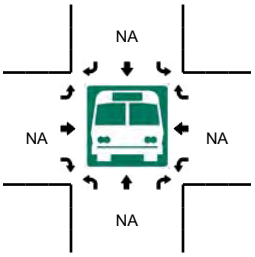












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School Drop Off (Eastbound)				Del Oro High School Drop Off (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	13	9	0	2	18	0	0	0	0	0	0	10	0	0	0	53	
7:05 AM	0	14	4	0	3	11	0	0	0	0	0	0	5	0	1	0	38	
7:10 AM	1	16	7	0	4	13	0	0	0	0	0	0	7	0	3	0	51	
7:15 AM	0	14	4	0	6	13	0	0	0	0	0	0	6	0	6	0	49	
7:20 AM	0	28	17	0	8	17	0	0	0	0	0	0	14	0	5	0	89	
7:25 AM	0	32	18	0	11	35	1	0	0	0	1	0	9	0	11	0	118	
7:30 AM	0	32	13	0	13	21	2	0	0	0	1	0	9	0	13	0	104	
7:35 AM	0	23	18	0	23	27	1	0	0	0	0	0	18	0	22	0	132	
7:40 AM	0	17	14	0	20	32	0	0	0	0	0	0	16	0	16	0	115	
7:45 AM	0	24	16	0	11	16	0	0	0	0	0	0	18	0	16	0	101	
7:50 AM	0	21	5	1	7	29	0	0	0	0	0	0	8	0	8	0	79	
7:55 AM	0	10	4	0	1	14	0	0	0	0	0	0	3	0	2	0	34	963
8:00 AM	0	11	2	0	2	16	0	0	0	0	0	0	2	0	0	0	33	943
8:05 AM	0	12	2	0	2	17	0	0	0	0	0	0	2	0	0	0	35	940
8:10 AM	0	15	0	0	1	16	0	0	0	0	0	0	2	0	0	0	34	923
8:15 AM	0	11	1	0	0	19	0	0	0	0	0	0	0	0	0	0	31	905
8:20 AM	0	9	0	0	1	17	0	0	0	0	0	0	0	0	0	0	27	843
8:25 AM	0	9	1	0	0	13	0	0	0	0	0	0	0	0	0	0	23	748
8:30 AM	1	11	3	0	0	14	0	0	0	0	0	0	1	0	1	0	31	675
8:35 AM	0	9	0	0	1	12	0	0	0	0	0	0	0	0	1	0	23	566
8:40 AM	0	10	1	0	0	14	0	0	0	0	0	0	1	0	0	0	26	477
8:45 AM	0	11	0	0	0	13	0	0	0	0	0	0	1	0	0	0	25	401
8:50 AM	0	7	0	0	0	15	0	0	0	0	0	0	0	0	0	0	22	344
8:55 AM	0	17	0	0	0	8	0	0	0	0	0	0	0	0	0	0	25	335

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	348	196	0	188	332	16	0	0	0	8	0	144	0	184	0	1416
Heavy Trucks	0	4	0		0	12	0		0	0	0		0	0	0		16
Pedestrians		0				16				4				0			20
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

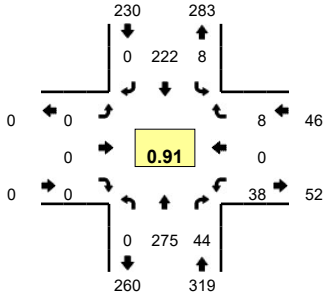
Type of peak hour being reported: Intersection Peak

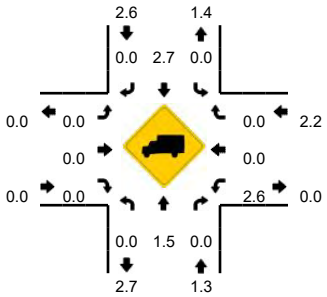
Method for determining peak hour: Total Entering Volume

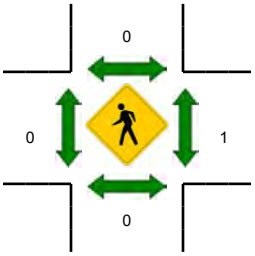
LOCATION: 29. Taylor Rd -- Del Oro High School Drop Off
CITY/STATE: Loomis, CA

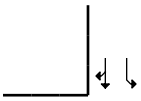
QC JOB #: 14812820
DATE: Wed, Oct 10 2018

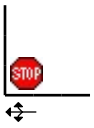
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

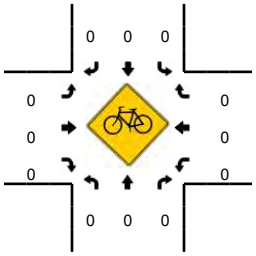


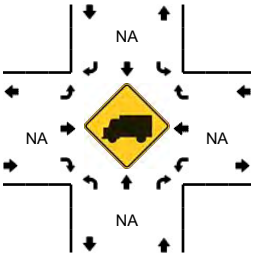


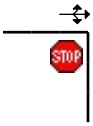


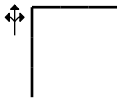


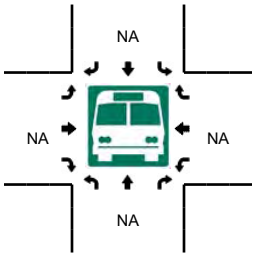












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School Drop Off (Eastbound)				Del Oro High School Drop Off (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	25	3	0	0	15	0	0	0	0	2	0	2	0	0	0	48	
4:05 PM	0	16	1	0	0	18	0	0	0	0	0	0	2	0	0	0	37	
4:10 PM	0	20	1	0	1	13	0	0	0	0	0	0	1	0	3	0	39	
4:15 PM	0	19	2	0	0	20	0	0	0	0	0	0	3	0	0	0	44	
4:20 PM	0	24	1	0	0	13	0	0	0	0	0	0	5	0	2	0	45	
4:25 PM	0	21	0	0	1	14	0	0	0	0	0	0	2	0	1	0	39	
4:30 PM	0	17	0	0	0	13	0	0	0	0	0	0	0	0	0	0	30	
4:35 PM	0	25	0	0	0	14	0	0	0	0	0	0	0	0	1	0	40	
4:40 PM	0	23	4	0	0	22	0	0	0	0	0	0	0	0	1	0	50	
4:45 PM	0	28	1	0	0	21	0	0	0	0	0	0	1	0	0	0	51	
4:50 PM	0	18	4	0	1	12	0	0	0	0	0	0	7	0	0	0	42	
4:55 PM	0	17	9	0	0	21	0	0	0	0	0	0	5	0	0	0	52	517
5:00 PM	0	16	3	0	3	14	0	0	0	0	0	0	5	0	0	0	41	510
5:05 PM	0	25	3	0	1	20	0	0	0	0	0	0	7	0	3	0	59	532
5:10 PM	0	17	4	0	0	19	0	0	0	0	0	0	5	0	0	0	45	538
5:15 PM	0	30	0	0	1	23	0	0	0	0	0	0	4	0	1	0	59	553
5:20 PM	0	25	1	0	0	20	0	0	0	0	0	0	0	0	0	0	46	554
5:25 PM	0	27	3	0	0	14	0	0	0	0	0	0	0	0	0	0	44	559
5:30 PM	0	28	3	0	1	17	0	0	0	0	0	0	2	0	0	0	51	580
5:35 PM	0	15	2	0	0	21	0	0	0	0	0	0	0	0	2	0	40	580
5:40 PM	0	25	5	0	0	19	0	0	0	0	0	0	4	0	1	0	54	584
5:45 PM	0	24	5	0	0	19	0	0	0	0	0	0	3	0	0	0	51	584
5:50 PM	0	26	6	0	2	15	0	0	0	0	0	0	3	0	1	0	53	595
5:55 PM	0	23	2	0	0	19	0	0	0	0	0	0	7	0	1	0	52	595

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	288	28	0	8	248	0	0	0	0	0	0	64	0	16	0	652
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

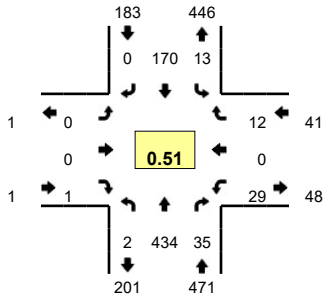
Type of peak hour being reported: Intersection Peak

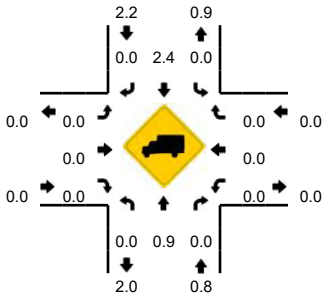
Method for determining peak hour: Total Entering Volume

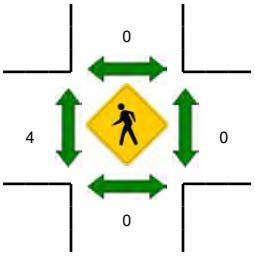
LOCATION: 29. Taylor Rd -- Del Oro High School Drop Off
CITY/STATE: Loomis, CA

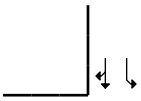
QC JOB #: 14812821
DATE: Sat, Oct 13 2018

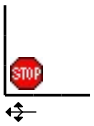
Peak-Hour: 11:05 AM -- 12:05 PM
Peak 15-Min: 11:15 AM -- 11:30 AM

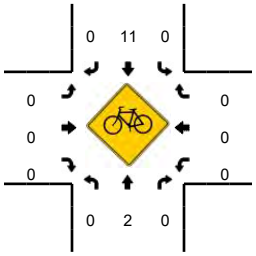


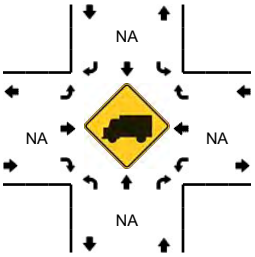


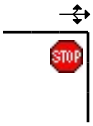


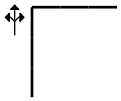


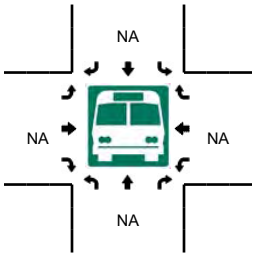












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School Drop Off (Eastbound)				Del Oro High School Drop Off (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	12	0	0	0	12	0	0	0	0	0	0	2	0	0	0	26	
11:05 AM	0	21	2	0	0	10	0	0	0	0	0	0	0	0	0	0	33	
11:10 AM	0	28	0	0	1	17	0	0	0	0	0	0	1	0	0	0	47	
11:15 AM	0	69	1	0	0	19	0	0	0	0	0	0	1	0	0	0	90	
11:20 AM	1	97	3	0	1	16	0	0	0	0	1	0	1	0	1	0	121	
11:25 AM	0	105	4	1	3	11	0	0	0	0	0	0	5	0	1	0	130	
11:30 AM	0	14	0	0	2	19	0	0	0	0	0	0	1	0	0	0	36	
11:35 AM	0	20	3	0	0	11	0	0	0	0	0	0	0	0	4	0	38	
11:40 AM	0	11	3	0	0	20	0	0	0	0	0	0	6	0	1	0	41	
11:45 AM	0	16	4	0	1	10	0	0	0	0	0	0	4	0	1	0	36	
11:50 AM	0	16	6	0	1	10	0	0	0	0	0	0	2	0	1	0	36	
11:55 AM	0	13	2	0	1	19	0	0	0	0	0	0	2	0	2	0	39	673
12:00 PM	0	24	7	0	3	8	0	0	0	0	0	0	6	0	1	0	49	696
12:05 PM	0	14	0	0	0	9	0	0	0	0	0	0	1	0	0	0	24	687
12:10 PM	0	19	1	0	0	15	0	0	0	0	0	0	1	0	0	0	36	676
12:15 PM	0	19	4	0	0	16	0	0	0	0	0	0	1	0	0	0	40	626
12:20 PM	0	21	0	0	0	15	0	0	0	0	0	0	0	0	1	0	37	542
12:25 PM	0	16	0	0	1	13	0	0	0	0	0	0	1	0	0	0	31	443
12:30 PM	0	15	0	0	1	15	0	0	0	0	0	0	0	0	0	0	31	438
12:35 PM	0	21	1	0	0	40	0	0	0	0	0	0	0	0	0	0	62	462
12:40 PM	0	12	0	0	0	11	0	0	0	0	0	0	1	0	0	0	24	445
12:45 PM	0	34	0	0	0	16	0	0	0	0	0	0	0	0	0	0	50	459
12:50 PM	0	22	2	0	0	18	0	0	0	0	0	0	0	0	0	0	42	465
12:55 PM	0	8	1	0	0	12	0	0	0	0	0	0	0	0	0	0	21	447

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	1084	32	4	16	184	0	0	0	0	4	0	28	0	8	0	1364
Heavy Trucks	0	8	0		0	4	0		0	0	0		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

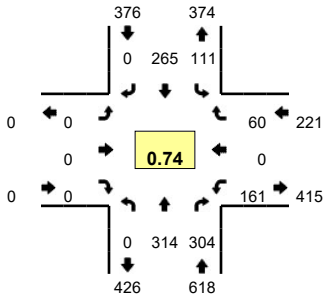
LOCATION: 29. Taylor Rd -- Del Oro High School South Lot

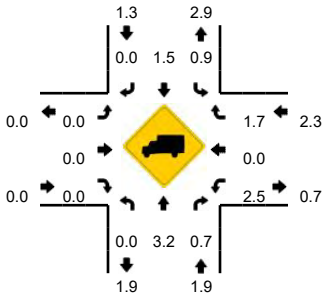
QC JOB #: 14812822

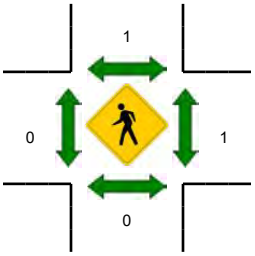
CITY/STATE: Loomis, CA

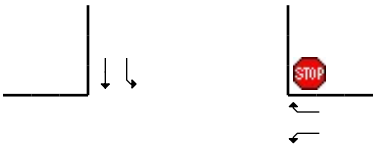
DATE: Wed, Oct 10 2018

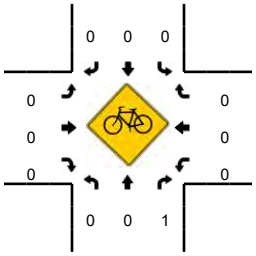
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

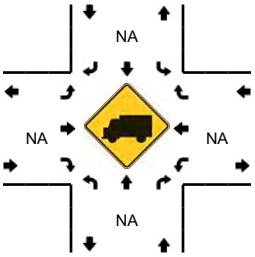


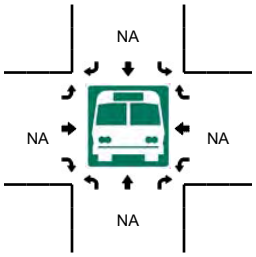












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School South Lot (Eastbound)				Del Oro High School South Lot (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	21	11	0	8	20	0	0	0	0	0	0	12	0	1	0	73	
7:05 AM	0	15	23	0	3	14	0	0	0	0	0	0	11	0	2	0	68	
7:10 AM	0	22	9	0	6	15	0	0	0	0	0	0	6	0	1	0	59	
7:15 AM	0	21	17	0	7	12	0	0	0	0	0	0	9	0	1	0	67	
7:20 AM	0	40	35	0	9	22	0	0	0	0	0	0	14	0	5	0	125	
7:25 AM	0	41	37	0	16	24	0	0	0	0	0	0	8	0	9	0	135	
7:30 AM	0	41	34	0	14	22	0	0	0	0	0	0	15	0	6	0	132	
7:35 AM	0	30	44	0	12	29	0	0	0	0	0	0	14	0	5	0	134	
7:40 AM	0	26	38	0	19	32	0	0	0	0	0	0	15	0	10	0	140	
7:45 AM	0	28	43	0	5	31	0	0	0	0	0	0	24	0	8	0	139	
7:50 AM	0	19	10	0	9	30	0	0	0	0	0	0	29	0	10	0	107	
7:55 AM	0	10	3	0	3	14	0	0	0	0	0	0	4	0	2	0	36	1215
8:00 AM	0	14	4	0	1	17	0	0	0	0	0	0	1	0	0	0	37	1179
8:05 AM	0	12	1	0	1	18	0	0	0	0	0	0	0	0	1	0	33	1144
8:10 AM	0	18	3	0	1	17	0	0	0	0	0	0	1	0	0	0	40	1125
8:15 AM	0	9	1	0	4	15	0	0	0	0	0	0	1	0	0	0	30	1088
8:20 AM	0	9	3	0	2	16	0	0	0	0	0	0	0	0	0	0	30	993
8:25 AM	0	8	4	0	1	12	0	0	0	0	0	0	1	0	2	0	28	886
8:30 AM	0	13	4	0	1	14	0	0	0	0	0	0	3	0	3	0	38	792
8:35 AM	0	7	1	0	0	12	0	0	0	0	0	0	1	0	1	0	22	680
8:40 AM	0	12	2	0	0	15	0	0	0	0	0	0	1	0	1	0	31	571
8:45 AM	0	9	2	0	0	14	0	0	0	0	0	0	3	0	1	0	29	461
8:50 AM	0	6	2	0	2	13	0	0	0	0	0	0	2	0	0	0	25	379
8:55 AM	0	17	4	0	0	8	0	0	0	0	0	0	1	0	0	0	30	373

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	336	500	0	144	368	0	0	0	0	0	0	212	0	92	0	1652
Heavy Trucks	0	4	8		0	4	0		0	0	0		8	0	4		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	1		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

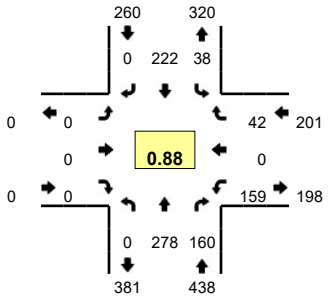
LOCATION: 29. Taylor Rd -- Del Oro High School South Lot

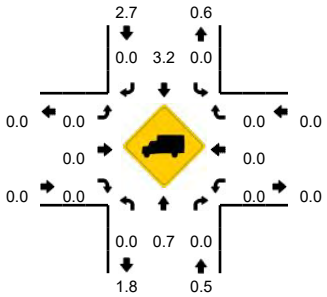
CITY/STATE: Loomis, CA

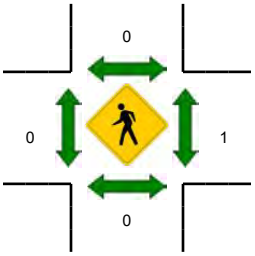
QC JOB #: 14812823

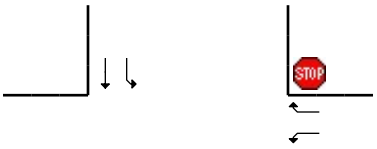
DATE: Wed, Oct 10 2018

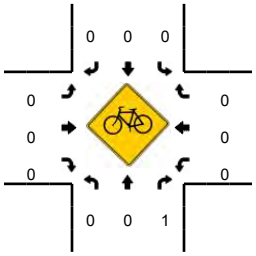
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:40 PM -- 5:55 PM

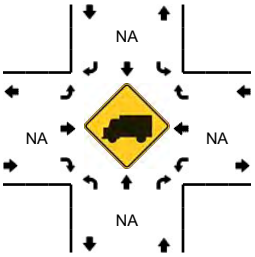


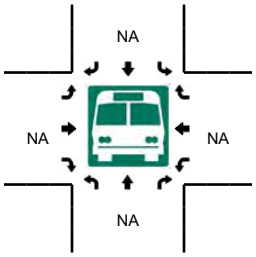












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School South Lot (Eastbound)				Del Oro High School South Lot (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	26	0	0	1	18	0	0	0	0	0	0	2	0	3	0	50	
4:05 PM	0	16	1	0	1	19	0	0	0	0	0	0	4	0	1	0	42	
4:10 PM	0	21	5	0	0	14	0	0	0	0	0	0	5	0	1	0	46	
4:15 PM	0	20	6	0	2	21	0	0	0	0	0	0	4	0	0	0	53	
4:20 PM	0	22	14	0	1	16	0	0	0	0	0	0	3	0	3	0	59	
4:25 PM	0	19	4	0	2	15	0	0	0	0	0	0	9	0	3	0	52	
4:30 PM	0	16	8	0	1	11	0	0	0	0	0	0	8	0	1	0	45	
4:35 PM	0	25	4	0	1	14	0	0	0	0	0	0	2	0	0	0	46	
4:40 PM	0	23	6	0	5	18	0	0	0	0	0	0	14	0	4	0	70	
4:45 PM	0	24	9	0	2	18	0	0	0	0	0	0	13	0	6	0	72	
4:50 PM	0	19	11	0	3	16	0	0	0	0	0	0	8	0	5	0	62	
4:55 PM	0	21	15	0	4	22	0	0	0	0	0	0	14	0	5	0	81	678
5:00 PM	0	15	12	0	1	18	0	0	0	0	0	0	12	0	3	0	61	689
5:05 PM	0	24	22	0	0	26	0	0	0	0	0	0	18	0	4	0	94	741
5:10 PM	0	19	8	0	8	15	0	0	0	0	0	0	13	0	2	0	65	760
5:15 PM	0	25	12	0	5	22	0	0	0	0	0	0	11	0	6	0	81	788
5:20 PM	0	21	13	0	6	13	0	0	0	0	0	0	12	0	4	0	69	798
5:25 PM	0	28	8	0	1	14	0	0	0	0	0	0	10	0	2	0	63	809
5:30 PM	0	29	7	0	2	17	0	0	0	0	0	0	7	0	3	0	65	829
5:35 PM	0	12	13	0	3	19	0	0	0	0	0	0	16	0	3	0	66	849
5:40 PM	0	29	15	0	5	18	0	0	0	0	0	0	11	0	3	0	81	860
5:45 PM	0	25	17	0	3	19	0	0	0	0	0	0	11	0	3	0	78	866
5:50 PM	0	30	18	0	0	19	0	0	0	0	0	0	24	0	4	0	95	899
5:55 PM	0	20	12	0	2	24	0	0	0	0	0	0	12	0	3	0	73	891

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	336	200	0	32	224	0	0	0	0	0	0	184	0	40	0	1016
Heavy Trucks	0	4	0		0	8	0		0	0	0		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

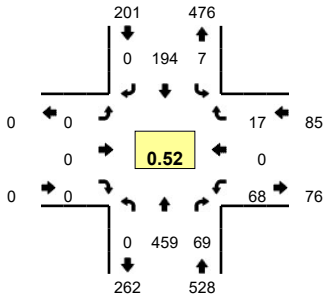
LOCATION: 29. Taylor Rd -- Del Oro High School South Lot

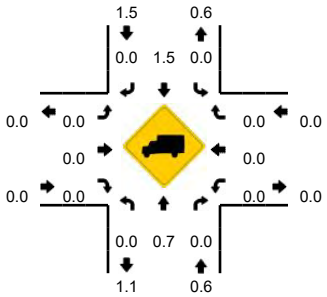
CITY/STATE: Loomis, CA

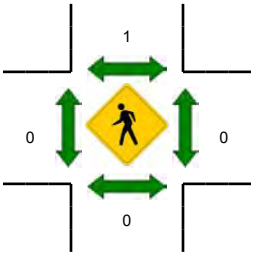
QC JOB #: 14812824

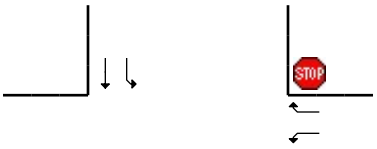
DATE: Sat, Oct 13 2018

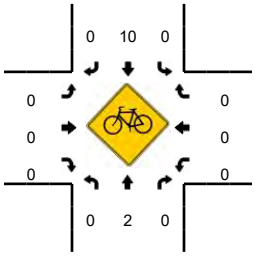
Peak-Hour: 11:05 AM -- 12:05 PM
Peak 15-Min: 11:15 AM -- 11:30 AM

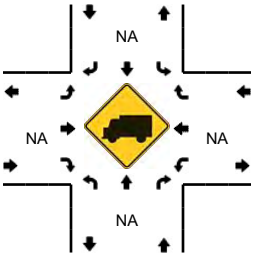


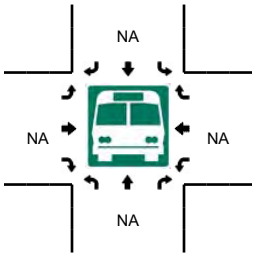












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Del Oro High School South Lot (Eastbound)				Del Oro High School South Lot (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	12	4	0	0	13	0	0	0	0	0	0	4	0	1	0	34	
11:05 AM	0	21	1	0	0	11	0	0	0	0	0	0	0	0	1	0	34	
11:10 AM	0	26	2	0	1	17	0	0	0	0	0	0	2	0	1	0	49	
11:15 AM	0	65	6	0	1	19	0	0	0	0	0	0	16	0	5	0	112	
11:20 AM	0	99	6	0	0	17	0	0	0	0	0	0	14	0	2	0	138	
11:25 AM	0	115	6	0	0	18	0	0	0	0	0	0	4	0	2	0	145	
11:30 AM	0	13	6	0	1	19	0	0	0	0	0	0	5	0	1	0	45	
11:35 AM	0	24	11	0	0	11	0	0	0	0	0	0	0	0	0	0	46	
11:40 AM	0	14	10	0	1	23	0	0	0	0	0	0	2	0	0	0	50	
11:45 AM	0	18	6	0	1	15	0	0	0	0	0	0	2	0	0	0	42	
11:50 AM	0	20	8	0	1	11	0	0	0	0	0	0	8	0	2	0	50	
11:55 AM	0	15	4	0	1	19	0	0	0	0	0	0	10	0	0	0	49	794
12:00 PM	0	29	3	0	0	14	0	0	0	0	0	0	5	0	3	0	54	814
12:05 PM	0	14	2	0	0	10	0	0	0	0	0	0	3	0	0	0	29	809
12:10 PM	0	19	4	0	0	16	0	0	0	0	0	0	1	0	0	0	40	800
12:15 PM	0	22	6	0	0	17	0	0	0	0	0	0	1	0	2	0	48	736
12:20 PM	0	21	2	0	1	13	0	0	0	0	0	0	1	0	0	0	38	636
12:25 PM	0	15	5	0	0	14	0	0	0	0	0	0	2	0	1	0	37	528
12:30 PM	0	15	1	0	0	15	0	0	0	0	0	0	2	0	0	0	33	516
12:35 PM	0	22	2	0	0	40	0	0	0	0	0	0	2	0	0	0	66	536
12:40 PM	0	10	2	0	1	11	0	0	0	0	0	0	2	0	1	0	27	513
12:45 PM	0	35	2	0	0	16	0	0	0	0	0	0	2	0	0	0	55	526
12:50 PM	0	23	1	0	0	18	0	0	0	0	0	0	3	0	1	0	46	522
12:55 PM	0	7	2	0	1	11	0	0	0	0	0	0	2	0	1	0	24	497

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	1116	72	0	4	216	0	0	0	0	0	0	136	0	36	0	1580
Heavy Trucks	0	8	0		0	0	0		0	0	0		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

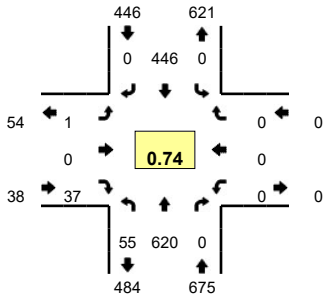
Type of peak hour being reported: Intersection Peak

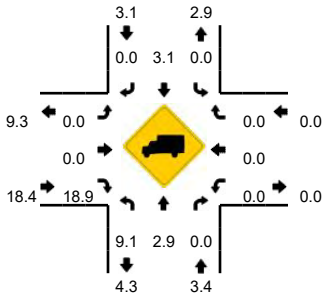
Method for determining peak hour: Total Entering Volume

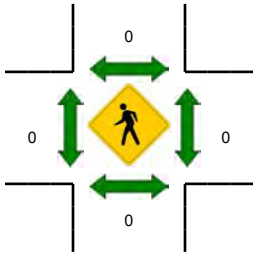
LOCATION: 29. Taylor Rd -- Rippey Rd
CITY/STATE: Loomis, CA

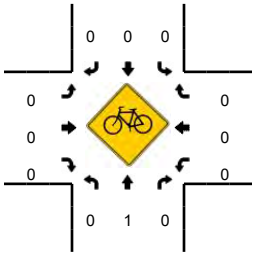
QC JOB #: 14812825
DATE: Wed, Oct 10 2018

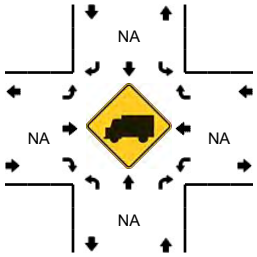
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

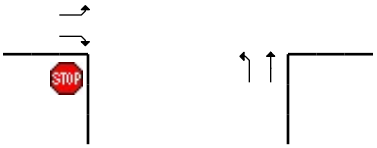


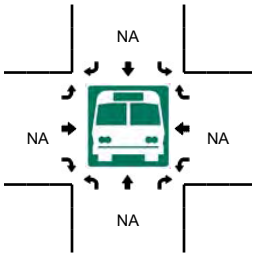












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Rippey Rd (Eastbound)				Rippey Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	34	0	0	0	32	0	0	0	0	4	0	0	0	0	0	73	
7:05 AM	4	41	0	0	0	28	0	0	0	0	3	0	0	0	0	0	76	
7:10 AM	4	31	0	0	0	25	0	0	0	0	3	0	0	0	0	0	63	
7:15 AM	6	50	0	1	0	22	0	0	0	0	3	0	0	0	0	0	82	
7:20 AM	7	78	0	0	0	33	0	0	0	0	2	0	0	0	0	0	120	
7:25 AM	4	91	0	0	0	41	0	0	0	0	0	0	0	0	0	0	136	
7:30 AM	6	88	0	0	0	36	0	0	0	0	4	0	0	0	0	0	134	
7:35 AM	4	65	0	0	0	50	0	0	0	0	4	0	0	0	0	0	123	
7:40 AM	6	66	0	0	0	44	0	0	0	0	2	0	0	0	0	0	118	
7:45 AM	3	37	0	0	0	50	0	0	0	0	3	0	0	0	0	0	93	
7:50 AM	5	26	0	0	0	61	0	0	0	0	6	0	0	0	0	0	98	
7:55 AM	2	13	0	0	0	24	0	0	1	0	3	0	0	0	0	0	43	1159
8:00 AM	8	19	0	0	0	19	0	0	1	0	0	0	0	0	0	0	47	1133
8:05 AM	7	15	0	2	0	29	0	0	0	0	4	0	0	0	0	0	57	1114
8:10 AM	3	19	0	1	0	22	0	0	0	0	1	0	0	0	0	0	46	1097
8:15 AM	7	16	0	1	0	16	0	0	0	0	3	0	0	0	0	0	43	1058
8:20 AM	5	17	0	0	0	22	0	0	0	0	1	0	0	0	0	0	45	983
8:25 AM	3	18	0	1	0	14	0	0	0	0	2	0	0	0	0	0	38	885
8:30 AM	2	11	0	0	0	17	1	0	0	0	2	0	0	0	0	0	33	784
8:35 AM	2	14	0	0	0	15	0	0	0	0	4	0	0	0	0	0	35	696
8:40 AM	4	12	0	0	0	23	1	0	0	0	2	0	0	0	0	0	42	620
8:45 AM	3	10	0	0	0	12	0	0	0	0	2	0	0	0	0	0	27	554
8:50 AM	7	14	0	0	0	20	0	0	0	0	3	0	0	0	0	0	44	500
8:55 AM	6	20	0	0	0	11	0	0	0	0	3	0	0	0	0	0	40	497

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	56	976	0	0	0	508	0	0	0	0	32	0	0	0	0	0	1572
Heavy Trucks	4	12	0		0	16	0		0	0	8		0	0	0		40
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

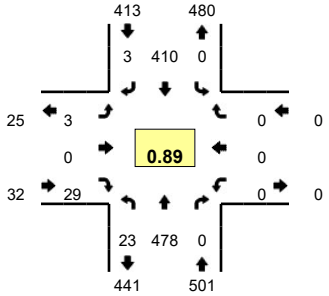
Type of peak hour being reported: Intersection Peak

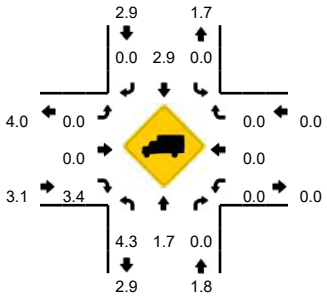
Method for determining peak hour: Total Entering Volume

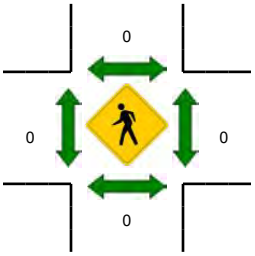
LOCATION: 29. Taylor Rd -- Rippey Rd
CITY/STATE: Loomis, CA

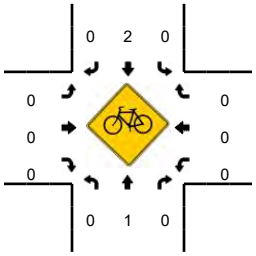
QC JOB #: 14812826
DATE: Wed, Oct 10 2018

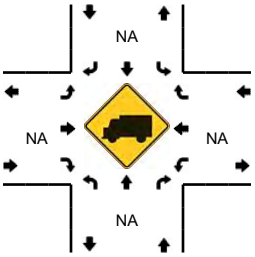
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:40 PM -- 5:55 PM

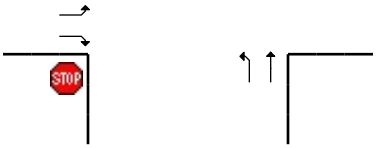


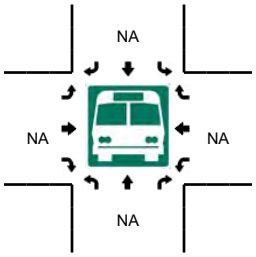












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Rippey Rd (Eastbound)				Rippey Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	28	0	1	0	22	0	0	0	0	5	0	0	0	0	0	59	
4:05 PM	2	30	0	0	0	27	0	0	1	0	7	0	0	0	0	0	67	
4:10 PM	2	24	0	0	0	19	0	0	1	0	4	0	0	0	0	0	50	
4:15 PM	1	30	0	0	0	29	0	0	1	0	7	0	0	0	0	0	68	
4:20 PM	2	35	0	0	0	23	0	0	1	0	5	0	0	0	0	0	66	
4:25 PM	1	27	0	0	0	28	0	0	0	0	3	0	0	0	0	0	59	
4:30 PM	2	30	0	0	0	22	0	0	0	0	1	0	0	0	0	0	55	
4:35 PM	1	32	0	0	0	19	0	0	0	0	1	0	0	0	0	0	53	
4:40 PM	2	33	0	0	0	34	0	0	0	0	1	0	0	0	0	0	70	
4:45 PM	4	34	0	0	0	37	1	0	0	0	4	0	0	0	0	0	80	
4:50 PM	4	36	0	0	0	27	0	0	0	0	3	0	0	0	0	0	70	
4:55 PM	1	41	0	0	0	34	0	0	0	0	4	0	0	0	0	0	80	777
5:00 PM	0	34	0	0	0	40	1	0	0	0	1	1	0	0	0	0	77	795
5:05 PM	1	41	0	0	0	47	0	0	0	0	3	0	0	0	0	0	92	820
5:10 PM	1	30	0	0	0	32	0	0	0	0	2	0	0	0	0	0	65	835
5:15 PM	0	43	0	0	0	35	0	0	0	0	1	0	0	0	0	0	79	846
5:20 PM	2	37	0	0	0	27	0	0	1	0	2	0	0	0	0	0	69	849
5:25 PM	3	36	0	1	0	26	0	0	0	0	4	0	0	0	0	0	70	860
5:30 PM	2	43	0	0	0	26	0	0	0	0	4	0	0	0	0	0	75	880
5:35 PM	4	35	0	0	0	30	0	0	0	0	3	0	0	0	0	0	72	899
5:40 PM	2	43	0	0	0	39	2	0	0	0	2	0	0	0	0	0	88	917
5:45 PM	2	46	0	1	0	33	0	0	1	0	1	0	0	0	0	0	84	921
5:50 PM	3	49	0	0	0	41	0	0	0	0	2	0	0	0	0	0	95	946
5:55 PM	0	36	0	0	0	41	0	0	0	0	2	0	0	0	0	0	79	945

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	552	0	4	0	452	8	0	4	0	20	0	0	0	0	0	1068
Heavy Trucks	0	4	0		0	20	0		0	0	4		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

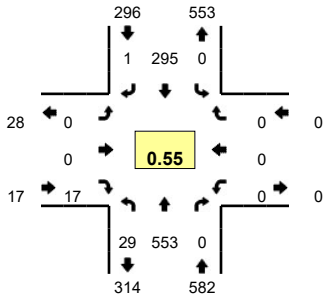
Type of peak hour being reported: Intersection Peak

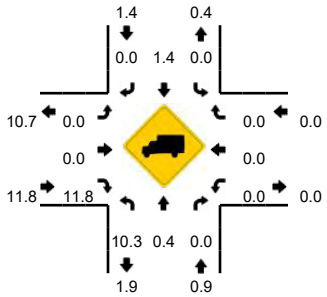
Method for determining peak hour: Total Entering Volume

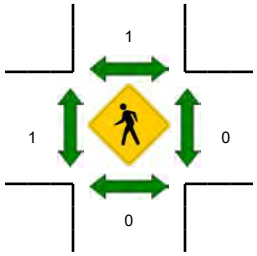
LOCATION: 29. Taylor Rd -- Rippey Rd
CITY/STATE: Loomis, CA

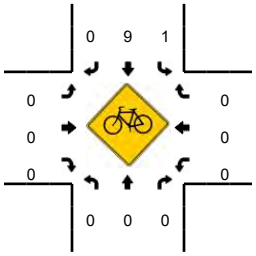
QC JOB #: 14812827
DATE: Sat, Oct 13 2018

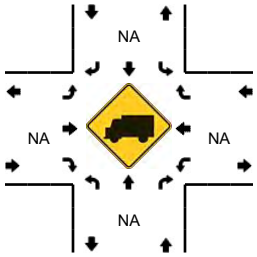
Peak-Hour: 11:05 AM -- 12:05 PM
Peak 15-Min: 11:15 AM -- 11:30 AM

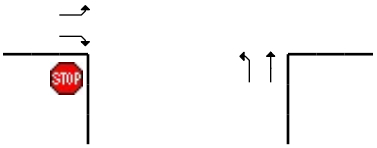


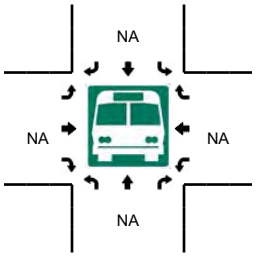












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Rippey Rd (Eastbound)				Rippey Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	19	0	0	0	20	0	0	0	0	1	0	0	0	0	0	40	
11:05 AM	3	33	0	0	0	15	0	0	0	0	2	0	0	0	0	0	53	
11:10 AM	2	27	0	1	0	22	0	0	0	0	1	0	0	0	0	0	53	
11:15 AM	2	79	0	0	0	34	1	0	0	0	2	0	0	0	0	0	118	
11:20 AM	2	128	0	0	0	33	0	0	0	0	2	0	0	0	0	0	165	
11:25 AM	2	91	0	0	0	29	0	0	0	0	1	0	0	0	0	0	123	
11:30 AM	1	19	0	0	0	27	0	0	0	0	0	0	0	0	0	0	47	
11:35 AM	0	37	0	0	0	12	0	0	0	0	1	0	0	0	0	0	50	
11:40 AM	5	27	0	1	0	28	0	0	0	0	0	0	0	0	0	0	61	
11:45 AM	3	29	0	0	0	20	0	0	0	0	3	0	0	0	0	0	55	
11:50 AM	1	26	0	0	0	25	0	0	0	0	2	0	0	0	0	0	54	
11:55 AM	3	25	0	0	0	26	0	0	0	0	1	0	0	0	0	0	55	874
12:00 PM	3	32	0	0	0	24	0	0	0	0	2	0	0	0	0	0	61	895
12:05 PM	0	23	0	0	0	18	0	0	0	0	2	0	0	0	0	0	43	885
12:10 PM	0	26	0	0	0	17	0	0	0	0	0	0	0	0	0	0	43	875
12:15 PM	2	28	0	0	0	18	0	0	0	0	0	0	0	0	0	0	48	805
12:20 PM	1	25	0	0	0	10	0	0	0	0	0	0	0	0	0	0	36	676
12:25 PM	2	23	0	0	0	18	0	0	0	0	2	0	0	0	0	0	45	598
12:30 PM	1	18	0	0	0	33	0	0	0	0	2	0	0	0	0	0	54	605
12:35 PM	3	21	0	1	0	43	1	0	0	0	1	0	0	0	0	0	70	625
12:40 PM	2	22	0	0	0	22	0	0	0	0	1	0	0	0	0	0	47	611
12:45 PM	2	36	0	0	0	20	0	0	0	0	2	0	0	0	0	0	60	616
12:50 PM	0	26	0	0	0	23	0	0	0	0	3	0	0	0	0	0	52	614
12:55 PM	1	20	0	0	0	18	0	0	0	0	1	0	0	0	0	0	40	599

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	1192	0	0	0	384	4	0	0	0	20	0	0	0	0	0	1624
Heavy Trucks	0	8	0		0	0	0		0	0	4		0	0	0		12
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		1	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

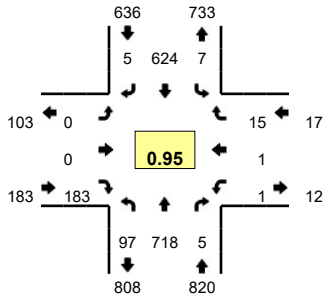
Type of peak hour being reported: Intersection Peak

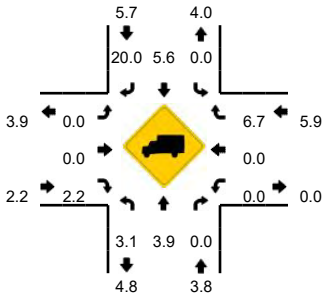
Method for determining peak hour: Total Entering Volume

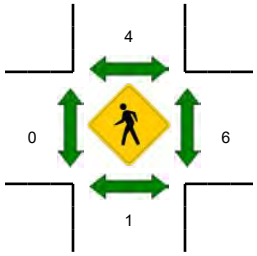
LOCATION: 29. Taylor Rd -- Webb St
CITY/STATE: Loomis, CA

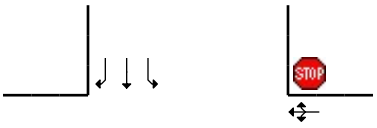
QC JOB #: 14812828
DATE: Wed, Oct 10 2018

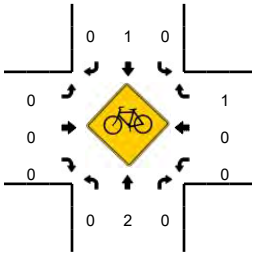
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

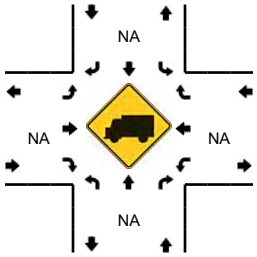


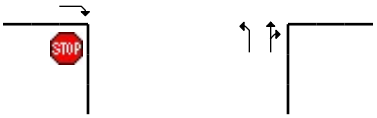


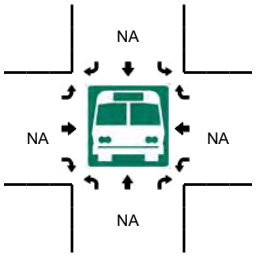












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Webb St (Eastbound)				Webb St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	57	0	0	2	47	0	0	0	0	8	0	0	0	0	0	119	
7:05 AM	7	40	0	0	2	54	2	0	0	0	10	0	0	1	0	0	116	
7:10 AM	3	63	0	0	1	41	1	0	0	0	5	0	0	0	0	0	114	
7:15 AM	5	61	1	0	1	44	1	0	0	0	21	0	0	0	0	0	134	
7:20 AM	4	67	0	0	1	46	0	0	0	0	15	0	0	0	1	0	134	
7:25 AM	6	77	0	0	0	45	0	0	0	0	16	0	0	0	1	0	145	
7:30 AM	4	74	1	0	0	52	0	0	0	0	11	0	0	0	1	0	143	
7:35 AM	5	61	0	0	0	56	0	0	0	0	7	0	0	0	1	0	130	
7:40 AM	12	57	2	0	1	64	0	0	0	0	11	0	0	0	1	0	148	
7:45 AM	11	50	0	0	1	67	0	0	0	0	16	0	0	0	0	0	145	
7:50 AM	8	48	0	0	1	63	3	0	0	0	15	0	0	1	4	0	143	
7:55 AM	12	51	0	0	0	48	0	0	0	0	14	0	0	0	1	0	126	1597
8:00 AM	15	63	0	0	0	38	0	0	0	0	20	0	0	0	1	0	137	1615
8:05 AM	9	51	1	0	1	42	1	0	0	0	21	0	1	0	2	0	129	1628
8:10 AM	6	58	0	0	1	59	0	0	0	0	16	0	0	0	2	0	142	1656
8:15 AM	5	54	0	0	0	55	0	0	0	0	16	0	0	0	1	0	131	1653
8:20 AM	10	57	0	0	1	48	0	0	0	0	15	0	0	0	0	0	131	1650
8:25 AM	3	46	0	0	0	55	1	0	0	1	16	0	0	0	1	0	123	1628
8:30 AM	6	31	0	0	0	51	0	0	0	0	15	0	0	0	1	0	104	1589
8:35 AM	8	44	0	0	1	42	1	0	0	0	13	0	1	0	3	0	113	1572
8:40 AM	5	32	1	0	1	40	0	0	0	0	10	0	0	0	0	0	89	1513
8:45 AM	7	40	0	0	2	35	0	0	0	0	8	0	0	0	2	0	94	1462
8:50 AM	7	42	1	0	0	39	1	0	0	0	7	0	0	0	0	0	97	1416
8:55 AM	5	49	0	0	0	30	0	0	0	0	12	0	0	1	1	0	98	1388

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	124	620	8	0	12	776	12	0	0	0	168	0	0	4	20	0	1744
Heavy Trucks	4	40	0		0	20	0		0	0	0		0	0	4		68
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

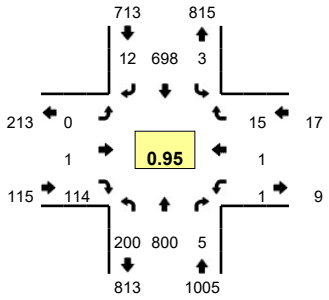
Type of peak hour being reported: Intersection Peak

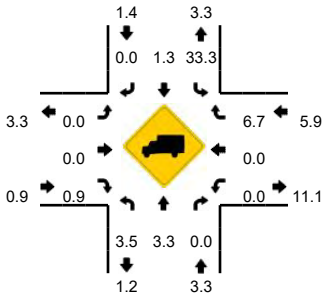
Method for determining peak hour: Total Entering Volume

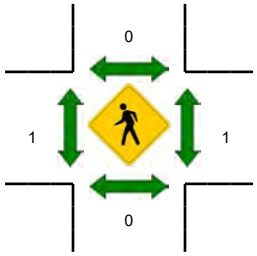
LOCATION: 29. Taylor Rd -- Webb St
CITY/STATE: Loomis, CA

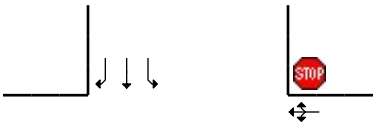
QC JOB #: 14812829
DATE: Wed, Oct 10 2018

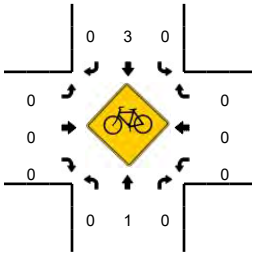
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

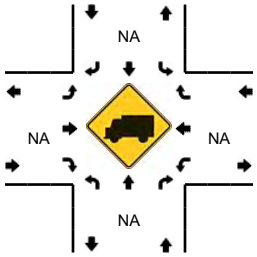


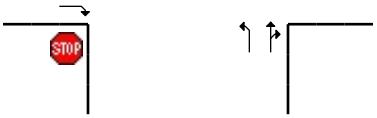


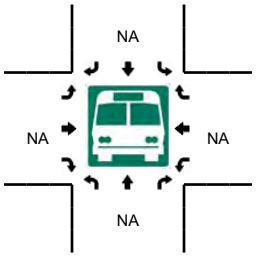












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Webb St (Eastbound)				Webb St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	62	5	0	0	53	0	0	0	0	9	0	0	0	0	0	139	
4:05 PM	21	54	1	0	3	58	0	0	0	0	10	0	0	0	4	0	151	
4:10 PM	8	49	0	0	1	59	0	0	0	0	19	0	0	0	3	0	139	
4:15 PM	14	57	0	0	0	56	1	0	0	0	8	0	0	0	0	0	136	
4:20 PM	14	62	0	0	1	48	0	0	0	0	8	0	0	0	0	0	133	
4:25 PM	24	58	0	0	0	45	1	0	0	0	5	0	0	0	0	0	133	
4:30 PM	14	46	0	0	0	58	0	0	0	0	8	0	0	0	1	0	127	
4:35 PM	14	55	0	0	0	57	1	0	0	0	11	0	0	0	0	0	138	
4:40 PM	17	55	1	0	0	50	0	0	0	0	13	0	0	0	0	0	136	
4:45 PM	20	61	1	0	1	50	1	0	0	0	11	0	0	0	1	0	146	
4:50 PM	14	52	2	0	1	36	0	0	0	0	13	0	0	0	1	0	119	
4:55 PM	16	55	1	0	1	54	0	0	0	0	6	0	0	0	0	0	133	1630
5:00 PM	29	63	2	0	0	54	2	0	0	0	11	0	0	0	3	0	164	1655
5:05 PM	9	68	0	0	0	69	0	0	0	0	7	0	0	0	0	0	153	1657
5:10 PM	15	79	0	0	0	65	1	0	0	0	9	0	0	0	2	0	171	1689
5:15 PM	25	70	1	0	0	54	0	0	0	0	13	0	0	0	0	0	163	1716
5:20 PM	15	59	0	0	0	40	2	0	0	0	10	0	1	0	2	0	129	1712
5:25 PM	13	75	0	0	1	52	1	0	0	0	6	0	0	0	4	0	152	1731
5:30 PM	15	64	0	0	1	75	0	0	0	0	12	0	0	0	2	0	169	1773
5:35 PM	20	58	2	0	0	57	0	0	0	1	13	0	0	1	1	0	153	1788
5:40 PM	12	72	0	0	1	60	4	0	0	0	9	0	0	0	1	0	159	1811
5:45 PM	10	70	0	0	0	43	1	0	0	0	12	0	0	0	0	0	136	1801
5:50 PM	19	67	0	0	0	64	1	0	0	0	6	0	0	0	0	0	157	1839
5:55 PM	18	55	0	0	0	65	0	0	0	0	6	0	0	0	0	0	144	1850

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	212	840	8	0	0	752	12	0	0	0	108	0	0	0	20	0	1952
Heavy Trucks	8	20	0		0	8	0		0	0	0		0	0	4		40
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

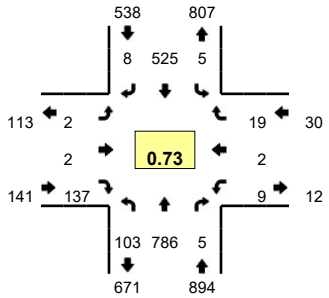
Type of peak hour being reported: Intersection Peak

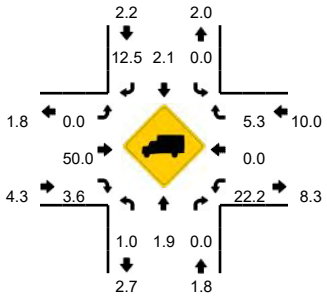
Method for determining peak hour: Total Entering Volume

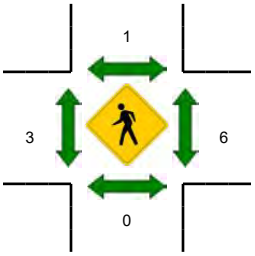
LOCATION: 29. Taylor Rd -- Webb St
CITY/STATE: Loomis, CA

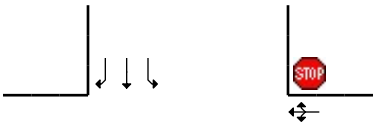
QC JOB #: 14812830
DATE: Sat, Oct 13 2018

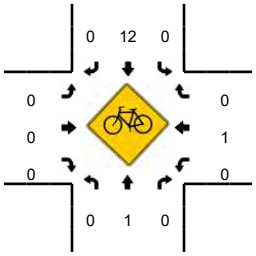
Peak-Hour: 11:15 AM -- 12:15 PM
Peak 15-Min: 11:15 AM -- 11:30 AM

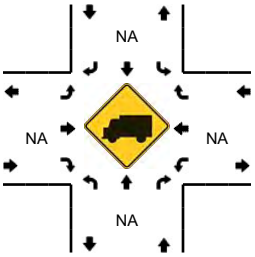


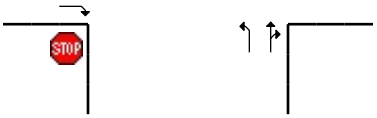


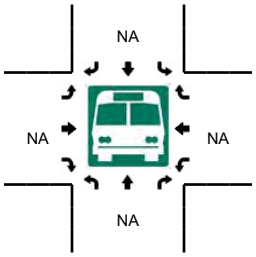












5-Min Count Period Beginning At	29. Taylor Rd (Northbound)				29. Taylor Rd (Southbound)				Webb St (Eastbound)				Webb St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	5	35	0	0	2	37	1	0	0	0	6	0	1	2	2	0	91	
11:05 AM	9	50	2	0	1	35	2	0	0	0	10	0	1	0	0	0	110	
11:10 AM	6	47	0	0	0	33	1	0	0	0	8	0	2	0	0	0	97	
11:15 AM	6	89	2	0	0	43	3	0	0	0	16	0	0	0	2	0	161	
11:20 AM	9	150	0	0	1	48	0	0	0	0	5	0	1	0	1	0	215	
11:25 AM	6	101	1	0	0	54	0	0	0	1	6	0	0	0	3	0	172	
11:30 AM	9	44	0	0	0	45	3	0	0	0	9	0	3	0	2	0	115	
11:35 AM	7	47	0	0	0	34	0	0	0	0	12	0	1	1	1	0	103	
11:40 AM	5	54	1	0	0	45	0	0	0	0	11	0	1	1	0	0	118	
11:45 AM	13	50	0	0	2	52	0	0	0	0	16	0	2	0	3	0	138	
11:50 AM	7	48	0	0	0	39	0	0	0	0	13	0	0	0	1	0	108	
11:55 AM	8	44	0	0	1	59	0	0	0	0	15	0	0	0	3	0	130	1558
12:00 PM	14	58	0	0	1	40	1	0	1	0	9	0	0	0	2	0	126	1593
12:05 PM	9	47	0	0	0	36	1	0	0	1	14	0	1	0	0	0	109	1592
12:10 PM	10	54	1	0	0	30	0	0	1	0	11	0	0	0	1	0	108	1603
12:15 PM	6	48	0	0	0	51	0	0	1	1	9	0	4	1	1	0	122	1564
12:20 PM	10	43	0	0	0	34	0	0	1	0	12	0	1	0	3	0	104	1453
12:25 PM	11	45	0	0	0	27	0	0	0	0	8	0	1	0	2	0	94	1375
12:30 PM	15	31	2	0	0	38	1	0	0	0	12	0	0	0	0	0	99	1359
12:35 PM	11	45	2	0	1	53	2	0	1	0	11	0	0	1	0	0	127	1383
12:40 PM	16	43	0	0	1	38	1	0	1	0	12	0	1	0	2	0	115	1380
12:45 PM	7	59	0	0	0	35	0	0	1	0	15	0	0	0	0	0	117	1359
12:50 PM	7	51	1	0	0	41	1	0	0	0	19	0	0	1	0	0	121	1372
12:55 PM	16	45	2	0	0	35	3	0	0	0	12	0	0	0	0	0	113	1355

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	84	1360	12	0	4	580	12	0	0	4	108	0	4	0	24	0	2192
Heavy Trucks	0	12	0		0	16	0		0	4	0		0	0	4		36
Pedestrians		0				0				4				4			8
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/25/2018 11:00 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B: Level-of-Service Worksheets (Synchro)

Existing Conditions

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	118	223	135	133	125	209	361	80	40	301	112
Future Volume (veh/h)	171	118	223	135	133	125	209	361	80	40	301	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1727	1727	1827	1844	1900	1827	1863	1863	1900	1819	1900
Adj Flow Rate, veh/h	197	136	256	155	153	144	240	415	92	46	346	129
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	10	10	4	5	5	4	2	2	0	5	5
Cap, veh/h	379	372	309	372	186	175	282	634	530	59	502	183
Arrive On Green	0.22	0.22	0.22	0.21	0.21	0.21	0.16	0.34	0.34	0.03	0.21	0.21
Sat Flow, veh/h	1757	1727	1433	1740	870	819	1740	1863	1558	1810	2445	892
Grp Volume(v), veh/h	197	136	256	155	0	297	240	415	92	46	242	233
Grp Sat Flow(s),veh/h/ln	1757	1727	1433	1740	0	1688	1740	1863	1558	1810	1728	1609
Q Serve(g_s), s	8.8	5.9	15.1	6.8	0.0	14.9	11.9	16.8	3.7	2.2	11.5	11.9
Cycle Q Clear(g_c), s	8.8	5.9	15.1	6.8	0.0	14.9	11.9	16.8	3.7	2.2	11.5	11.9
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	379	372	309	372	0	361	282	634	530	59	355	330
V/C Ratio(X)	0.52	0.37	0.83	0.42	0.00	0.82	0.85	0.65	0.17	0.78	0.68	0.70
Avail Cap(c_a), veh/h	555	545	452	549	0	533	490	840	703	520	779	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	29.6	33.2	30.1	0.0	33.2	36.1	24.8	20.5	42.6	32.6	32.7
Incr Delay (d2), s/veh	0.4	0.2	5.3	0.3	0.0	4.1	7.1	0.4	0.1	7.9	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.9	6.4	3.3	0.0	7.3	6.3	8.6	1.6	1.2	5.5	5.4
LnGrp Delay(d),s/veh	31.1	29.8	38.5	30.4	0.0	37.3	43.3	25.3	20.6	50.5	33.4	33.8
LnGrp LOS	C	C	D	C		D	D	C	C	D	C	C
Approach Vol, veh/h		589			452			747			521	
Approach Delay, s/veh		34.0			34.9			30.5			35.1	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	35.7		23.1	18.9	23.7		23.0
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	25.5	40.0		28.0	25.0	40.0		28.0
Max Q Clear Time (g_c+I1), s	4.2	18.8		17.1	13.9	13.9		16.9
Green Ext Time (p_c), s	0.0	3.9		1.1	0.5	4.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	33.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	45	11	50	7	490	2	325	55	428	340	1
Future Volume (veh/h)	6	45	11	50	7	490	2	325	55	428	340	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1813	1900	1900	1900	1827	1900	1827	1827	1827	1793	1900
Adj Flow Rate, veh/h	6	48	12	54	8	527	2	349	59	460	366	1
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	4	0	4	4	4	6	6
Cap, veh/h	76	374	86	453	60	825	3	509	426	439	946	3
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.00	0.28	0.28	0.25	0.53	0.53
Sat Flow, veh/h	52	1337	309	1238	215	1547	1810	1827	1531	1740	1787	5
Grp Volume(v), veh/h	66	0	0	62	0	527	2	349	59	460	0	367
Grp Sat Flow(s),veh/h/ln	1697	0	0	1454	0	1547	1810	1827	1531	1740	0	1792
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	15.3	0.1	10.8	1.8	16.0	0.0	7.7
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.6	0.0	15.3	0.1	10.8	1.8	16.0	0.0	7.7
Prop In Lane	0.09		0.18	0.87		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	536	0	0	513	0	825	3	509	426	439	0	949
V/C Ratio(X)	0.12	0.00	0.00	0.12	0.00	0.64	0.67	0.69	0.14	1.05	0.00	0.39
Avail Cap(c_a), veh/h	594	0	0	530	0	844	457	1038	869	439	0	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	0.0	17.0	0.0	10.5	31.6	20.4	17.2	23.7	0.0	8.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	1.6	68.8	1.6	0.1	55.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.8	0.0	6.8	0.1	5.7	0.8	14.4	0.0	3.8
LnGrp Delay(d),s/veh	17.2	0.0	0.0	17.1	0.0	12.1	100.4	22.0	17.3	79.5	0.0	9.1
LnGrp LOS	B			B		B	F	C	B	F		A
Approach Vol, veh/h		66			589			410			827	
Approach Delay, s/veh		17.2			12.6			21.7			48.3	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	21.7		21.7	4.1	37.6		21.7
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	36.0		20.0	16.0	36.0		18.5
Max Q Clear Time (g_c+I1), s	18.0	12.8		3.8	2.1	9.7		17.3
Green Ext Time (p_c), s	0.0	4.9		2.6	0.0	5.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Future Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1841	1845	1863	1804	1900	1863	1835	1900	1900	1810	1810
Adj Flow Rate, veh/h	64	35	133	55	57	29	182	563	68	20	241	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	3	2	8	8	2	4	4	0	5	5
Cap, veh/h	157	86	213	208	132	67	236	1168	141	45	479	407
Arrive On Green	0.14	0.14	0.14	0.12	0.12	0.12	0.13	0.37	0.37	0.02	0.26	0.00
Sat Flow, veh/h	1153	630	1568	1774	1129	574	1774	3133	377	1810	1810	1538
Grp Volume(v), veh/h	99	0	133	55	0	86	182	313	318	20	241	0
Grp Sat Flow(s),veh/h/ln	1783	0	1568	1774	0	1703	1774	1743	1768	1810	1810	1538
Q Serve(g_s), s	2.1	0.0	3.3	1.2	0.0	1.9	4.1	5.6	5.6	0.4	4.6	0.0
Cycle Q Clear(g_c), s	2.1	0.0	3.3	1.2	0.0	1.9	4.1	5.6	5.6	0.4	4.6	0.0
Prop In Lane	0.65		1.00	1.00		0.34	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	243	0	213	208	0	199	236	650	659	45	479	407
V/C Ratio(X)	0.41	0.00	0.62	0.26	0.00	0.43	0.77	0.48	0.48	0.44	0.50	0.00
Avail Cap(c_a), veh/h	1306	0	1149	1083	0	1040	867	1703	1727	884	1768	1503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.2	0.0	16.7	16.5	0.0	16.8	17.1	9.8	9.8	19.7	12.8	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.1	0.2	0.0	0.5	2.0	0.3	0.3	2.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.5	0.6	0.0	0.9	2.1	2.7	2.8	0.3	2.3	0.0
LnGrp Delay(d),s/veh	16.6	0.0	17.8	16.7	0.0	17.4	19.2	10.1	10.1	22.2	13.2	0.0
LnGrp LOS	B		B	B		B	B	B	B	C	B	
Approach Vol, veh/h		232			141			813			261	
Approach Delay, s/veh		17.3			17.1			12.1			13.9	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.0	19.0		9.1	8.4	14.5		8.9
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		25.0
Max Q Clear Time (g_c+I1), s	2.4	7.6		5.3	6.1	6.6		3.9
Green Ext Time (p_c), s	0.0	4.2		0.5	0.2	4.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	26.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	393	347	88	80	309
Future Vol, veh/h	92	393	347	88	80	309
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	3	6	10	2
Mvmt Flow	101	432	381	97	88	340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	896	381	0	0	381	0
Stage 1	381	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.29	-
Pot Cap-1 Maneuver	311	662	-	-	1135	-
Stage 1	691	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	281	662	-	-	1135	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.2	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	527	1135	-
HCM Lane V/C Ratio	-	-	1.011	0.077	-
HCM Control Delay (s)	-	-	70.2	8.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	14.5	0.3	-

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	117	23	67	94	33	68
Future Vol, veh/h	117	23	67	94	33	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	9	7	3	18	6
Mvmt Flow	133	26	76	107	38	77

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	159	0	405	146
Stage 1	-	-	-	-	146	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	-	-	4.17	-	6.58	6.26
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.263	-	3.662	3.354
Pot Cap-1 Maneuver	-	-	1390	-	572	891
Stage 1	-	-	-	-	844	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1390	-	539	891
Mov Cap-2 Maneuver	-	-	-	-	539	-
Stage 1	-	-	-	-	844	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	734	-	-	1390	-
HCM Lane V/C Ratio	0.156	-	-	0.055	-
HCM Control Delay (s)	10.8	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	172	81	206	179	21	147	278	154	28	595	110
Future Volume (veh/h)	62	172	81	206	179	21	147	278	154	28	595	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1743	1863	1743	1810	1727	1792	1810	1827	1863	1881
Adj Flow Rate, veh/h	66	183	86	219	190	22	156	296	164	30	633	117
Adj No. of Lanes	1	1	1	2	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	9	2	9	5	10	6	5	4	2	1
Cap, veh/h	85	308	255	317	374	323	192	858	878	41	719	617
Arrive On Green	0.05	0.17	0.17	0.09	0.21	0.21	0.12	0.48	0.48	0.02	0.39	0.39
Sat Flow, veh/h	1707	1792	1482	3442	1743	1505	1645	1792	1538	1740	1863	1599
Grp Volume(v), veh/h	66	183	86	219	190	22	156	296	164	30	633	117
Grp Sat Flow(s),veh/h/ln	1707	1792	1482	1721	1743	1505	1645	1792	1538	1740	1863	1599
Q Serve(g_s), s	3.3	8.1	4.4	5.3	8.2	1.0	7.9	8.8	4.4	1.5	27.1	4.2
Cycle Q Clear(g_c), s	3.3	8.1	4.4	5.3	8.2	1.0	7.9	8.8	4.4	1.5	27.1	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	308	255	317	374	323	192	858	878	41	719	617
V/C Ratio(X)	0.78	0.59	0.34	0.69	0.51	0.07	0.81	0.34	0.19	0.72	0.88	0.19
Avail Cap(c_a), veh/h	398	627	518	1003	711	614	479	858	878	406	760	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	32.7	31.2	37.7	29.7	26.9	36.9	13.9	8.8	41.6	24.5	17.5
Incr Delay (d2), s/veh	14.0	3.9	1.7	2.7	2.3	0.2	7.9	0.5	0.2	21.0	12.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.3	1.9	2.6	4.2	0.4	4.0	4.5	1.9	0.9	16.4	1.9
LnGrp Delay(d),s/veh	54.3	36.6	32.9	40.4	32.0	27.1	44.9	14.5	9.0	62.6	36.9	17.8
LnGrp LOS	D	D	C	D	C	C	D	B	A	E	D	B
Approach Vol, veh/h		335			431			616			780	
Approach Delay, s/veh		39.1			36.0			20.7			35.0	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	46.6	12.4	20.2	14.5	38.6	8.8	23.9
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	20.0	40.0	25.0	30.0	25.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	3.5	10.8	7.3	10.1	9.9	29.1	5.3	10.2
Green Ext Time (p_c), s	0.0	15.9	0.7	4.7	0.3	4.0	0.1	5.1

Intersection Summary	
HCM 2010 Ctrl Delay	31.8
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	104	0	91	0	503	50	127	755	1
Future Volume (vph)	0	0	104	104	0	91	0	503	50	127	755	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.99		1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1457	1766		1495		3371		1736	3539	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1457	1766		1495		3371		1736	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	111	0	97	0	535	53	135	803	1
RTOR Reduction (vph)	0	0	93	0	0	81	0	8	0	0	0	0
Lane Group Flow (vph)	0	0	18	111	0	16	0	580	0	135	804	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	
Protected Phases								6		5	2	
Permitted Phases			4	8		8						
Actuated Green, G (s)			7.7	7.7		7.7		20.4		5.9	30.3	
Effective Green, g (s)			7.7	7.7		7.7		20.4		5.9	30.3	
Actuated g/C Ratio			0.16	0.16		0.16		0.43		0.12	0.64	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			236	286		242		1447		215	2257	
v/s Ratio Prot								c0.17		c0.08	0.23	
v/s Ratio Perm			0.01	c0.06		0.01						
v/c Ratio			0.08	0.39		0.06		0.40		0.63	0.36	
Uniform Delay, d1			16.9	17.8		16.9		9.3		19.8	4.0	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			0.1	1.2		0.2		0.2		4.1	0.1	
Delay (s)			17.0	19.0		17.0		9.6		23.8	4.2	
Level of Service			B	B		B		A		C	A	
Approach Delay (s)		17.0			18.1			9.6			7.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	23	109	149	41	28	225	471	113	89	786	83
Future Volume (veh/h)	71	23	109	149	41	28	225	471	113	89	786	83
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1776	1881	1743	1845	1863
Adj Flow Rate, veh/h	74	24	114	155	43	29	234	491	118	93	819	86
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	1	9	3	2
Cap, veh/h	95	132	185	192	232	203	279	1820	862	119	1568	699
Arrive On Green	0.06	0.08	0.08	0.12	0.13	0.13	0.16	0.54	0.54	0.07	0.45	0.45
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	3374	1598	1660	3505	1562
Grp Volume(v), veh/h	74	24	114	155	43	29	234	491	118	93	819	86
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1687	1598	1660	1752	1562
Q Serve(g_s), s	3.8	1.1	3.9	7.9	1.9	1.5	11.5	6.8	3.2	4.8	14.5	2.8
Cycle Q Clear(g_c), s	3.8	1.1	3.9	7.9	1.9	1.5	11.5	6.8	3.2	4.8	14.5	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	95	132	185	192	232	203	279	1820	862	119	1568	699
V/C Ratio(X)	0.78	0.18	0.62	0.81	0.19	0.14	0.84	0.27	0.14	0.78	0.52	0.12
Avail Cap(c_a), veh/h	572	606	852	572	600	525	890	1954	925	385	2030	905
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	37.4	38.7	37.2	33.2	33.0	35.0	10.7	9.9	39.4	17.2	13.9
Incr Delay (d2), s/veh	12.9	0.7	3.3	7.8	0.4	0.3	6.6	0.2	0.2	10.7	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.6	1.4	4.0	0.9	0.6	5.9	3.2	1.4	2.5	7.1	1.2
LnGrp Delay(d),s/veh	53.0	38.1	42.0	45.0	33.5	33.3	41.6	10.9	10.0	50.1	17.8	14.1
LnGrp LOS	D	D	D	D	C	C	D	B	B	D	B	B
Approach Vol, veh/h		212			227			843			998	
Approach Delay, s/veh		45.4			41.3			19.3			20.5	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	51.6	14.1	10.5	18.1	43.6	9.0	15.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	6.8	8.8	9.9	5.9	13.5	16.5	5.8	3.9
Green Ext Time (p_c), s	0.2	25.3	0.4	0.9	0.7	22.1	0.2	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	64	609	64	226	76	620	145	0	1018	38
Future Volume (veh/h)	5	0	64	609	64	226	76	620	145	0	1018	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1759	1845	1812	1776	1827	1792	1681	0	1696	1900
Adj Flow Rate, veh/h	5	0	70	669	204	159	84	681	159	0	1119	42
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	8	3	2	7	4	6	13	0	12	0
Cap, veh/h	12	0	0	818	285	237	122	2597	758	0	1725	602
Arrive On Green	0.01	0.00	0.00	0.23	0.16	0.16	0.07	0.53	0.53	0.00	0.37	0.37
Sat Flow, veh/h	1810	5		3514	1812	1509	1740	4893	1429	0	4784	1615
Grp Volume(v), veh/h	5	31.7		669	204	159	84	681	159	0	1119	42
Grp Sat Flow(s),veh/h/ln	1810	C		1757	1812	1509	1740	1631	1429	0	1544	1615
Q Serve(g_s), s	0.1			8.6	5.1	4.7	2.3	3.6	2.8	0.0	9.6	0.8
Cycle Q Clear(g_c), s	0.1			8.6	5.1	4.7	2.3	3.6	2.8	0.0	9.6	0.8
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	12			818	285	237	122	2597	758	0	1725	602
V/C Ratio(X)	0.41			0.82	0.72	0.67	0.69	0.26	0.21	0.00	0.65	0.07
Avail Cap(c_a), veh/h	757			4372	1326	1105	1091	7081	2068	0	3389	1182
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	23.7			17.4	19.1	19.0	21.7	6.1	5.9	0.0	12.4	9.7
Incr Delay (d2), s/veh	8.0			0.8	1.3	1.2	2.5	0.0	0.1	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1			4.3	2.6	2.0	1.2	1.6	1.1	0.0	4.1	0.4
LnGrp Delay(d),s/veh	31.7			18.2	20.4	20.2	24.3	6.1	6.0	0.0	12.6	9.7
LnGrp LOS	C			B	C	C	C	A	A		B	A
Approach Vol, veh/h					1032			924			1161	
Approach Delay, s/veh					18.9			7.8			12.5	
Approach LOS					B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		31.1	15.5		7.6	23.5	4.4	12.3
Change Period (Y+Rc), s		5.7	4.4		* 4.2	5.7	4.1	4.8
Max Green Setting (Gmax), s		69.2	59.5		* 30	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s		5.6	10.6		4.3	11.6	2.1	7.1
Green Ext Time (p_c), s		6.8	0.5		0.0	6.3	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	94	183	39	0	94	0	757	20	172	1001	169
Future Volume (veh/h)	306	94	183	39	0	94	0	757	20	172	1001	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1845	1776	1845	0	1863	0	1667	1792	1863	1863	1743
Adj Flow Rate, veh/h	352	108	210	45	0	108	0	870	23	198	1151	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	7	3	7	3	0	2	0	14	6	2	2	9
Cap, veh/h	522	622	268	114	0	0	0	1805	480	320	1732	725
Arrive On Green	0.16	0.18	0.18	0.06	0.00	0.00	0.00	0.31	0.31	0.09	0.49	0.00
Sat Flow, veh/h	3281	3505	1509	1757	45		0	5967	1524	3442	3539	1482
Grp Volume(v), veh/h	352	108	210	45	23.4		0	870	23	198	1151	0
Grp Sat Flow(s),veh/h/ln	1640	1752	1509	1757	C		0	1433	1524	1721	1770	1482
Q Serve(g_s), s	5.1	1.3	6.7	1.2			0.0	6.2	0.5	2.8	12.4	0.0
Cycle Q Clear(g_c), s	5.1	1.3	6.7	1.2			0.0	6.2	0.5	2.8	12.4	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	522	622	268	114			0	1805	480	320	1732	725
V/C Ratio(X)	0.67	0.17	0.78	0.39			0.00	0.48	0.05	0.62	0.66	0.00
Avail Cap(c_a), veh/h	3259	2437	1049	1396			0	5125	1362	1709	5210	2181
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	17.6	19.8	22.6			0.0	13.9	12.0	22.0	9.7	0.0
Incr Delay (d2), s/veh	1.1	0.0	1.9	0.8			0.0	0.1	0.0	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.6	2.9	0.6			0.0	2.4	0.2	1.4	6.0	0.0
LnGrp Delay(d),s/veh	21.1	17.6	21.7	23.4			0.0	14.0	12.0	22.7	9.9	0.0
LnGrp LOS	C	B	C	C				B	B	C	A	
Approach Vol, veh/h		670						893			1349	
Approach Delay, s/veh		20.7						14.0			11.8	
Approach LOS		C						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	8.8	21.5	7.0	13.0		30.3	12.1	
Change Period (Y+Rc), s	4.1	5.7	3.7	4.1		5.7	4.1	
Max Green Setting (Gmax), s	25.0	45.0	40.0	35.0		74.1	50.0	
Max Q Clear Time (g_c+I1), s	4.8	8.2	3.2	8.7		14.4	7.1	
Green Ext Time (p_c), s	0.1	7.7	0.0	0.4		7.9	1.0	

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Notes

HCM Unsignalized Intersection Capacity Analysis
11: Sierra College Blvd & Schriber Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	79	698	21	0	1223
Future Volume (Veh/h)	0	79	698	21	0	1223
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	98	862	26	0	1510
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			443			404
pX, platoon unblocked	0.76	0.97			0.97	
vC, conflicting volume	1631	230			889	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868	24			707	
tC, single (s)	6.8	7.4			5.1	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.7	
p0 queue free %	100	90			100	
cM capacity (veh/h)	225	945			609	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	98	246	246	246	149	755	755
Volume Left	0	0	0	0	0	0	0
Volume Right	98	0	0	0	26	0	0
cSH	945	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.14	0.14	0.14	0.09	0.44	0.44
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.2	0.0				0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	1	36	1	4	0	713	22	35	1185	3
Future Volume (veh/h)	2	0	1	36	1	4	0	713	22	35	1185	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1267	1900	1900	1597	1900	1520	1900	1792	1743	1387	1827	1429
Adj Flow Rate, veh/h	2	0	1	45	1	5	0	891	28	44	1481	4
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	50	0	0	19	0	25	0	6	9	37	4	33
Cap, veh/h	3	0	2	115	72	49	2	3332	1008	51	2686	939
Arrive On Green	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.68	0.68	0.04	0.77	0.77
Sat Flow, veh/h	1206	0	1615	2950	1900	1292	1810	4893	1481	1321	3471	1214
Grp Volume(v), veh/h	2	0	1	45	1	5	0	891	28	44	1481	4
Grp Sat Flow(s),veh/h/ln	1206	0	1615	1475	1900	1292	1810	1631	1481	1321	1736	1214
Q Serve(g_s), s	0.1	0.0	0.1	1.2	0.0	0.3	0.0	5.9	0.5	2.7	13.9	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	1.2	0.0	0.3	0.0	5.9	0.5	2.7	13.9	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	0	2	115	72	49	2	3332	1008	51	2686	939
V/C Ratio(X)	0.61	0.00	0.45	0.39	0.01	0.10	0.00	0.27	0.03	0.86	0.55	0.00
Avail Cap(c_a), veh/h	439	0	784	1074	922	627	659	3563	1078	962	3791	1325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	0.0	41.1	38.6	38.2	38.3	0.0	5.1	4.3	39.4	3.7	2.1
Incr Delay (d2), s/veh	113.1	0.0	117.7	2.2	0.1	1.1	0.0	0.1	0.0	32.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.5	0.0	0.1	0.0	2.7	0.2	1.4	6.5	0.0
LnGrp Delay(d),s/veh	154.2	0.0	158.9	40.8	38.3	39.4	0.0	5.2	4.3	71.5	3.9	2.1
LnGrp LOS	F		F	D	D	D		A	A	E	A	A
Approach Vol, veh/h		3			51			919			1529	
Approach Delay, s/veh		155.7			40.6			5.2			5.8	
Approach LOS		F			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	61.9	7.7	5.1	0.0	69.6	4.7	8.1
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	60.0	60.0	30.0	40.0	30.0	90.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	4.7	7.9	3.2	2.1	0.0	15.9	2.1	2.3
Green Ext Time (p_c), s	0.1	37.8	0.1	0.0	0.0	47.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	8	73	683	1042	304
Future Volume (veh/h)	22	8	73	683	1042	304
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1900	1900	1810	1829	1900
Adj Flow Rate, veh/h	29	11	96	899	1371	400
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	5	0	0	5	5	5
Cap, veh/h	121	58	128	2896	2760	802
Arrive On Green	0.04	0.04	0.07	0.84	0.72	0.72
Sat Flow, veh/h	3343	1615	1810	3529	4008	1117
Grp Volume(v), veh/h	29	11	96	899	1187	584
Grp Sat Flow(s),veh/h/ln	1672	1615	1810	1719	1665	1631
Q Serve(g_s), s	0.7	0.6	4.4	4.7	13.1	13.2
Cycle Q Clear(g_c), s	0.7	0.6	4.4	4.7	13.1	13.2
Prop In Lane	1.00	1.00	1.00			0.68
Lane Grp Cap(c), veh/h	121	58	128	2896	2391	1171
V/C Ratio(X)	0.24	0.19	0.75	0.31	0.50	0.50
Avail Cap(c_a), veh/h	1595	770	863	4284	2391	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	39.2	38.3	1.4	5.2	5.2
Incr Delay (d2), s/veh	1.0	1.5	8.6	0.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	2.5	2.2	6.0	6.0
LnGrp Delay(d),s/veh	40.3	40.8	46.9	1.5	5.4	5.6
LnGrp LOS	D	D	D	A	A	A
Approach Vol, veh/h	40			995	1771	
Approach Delay, s/veh	40.4			5.9	5.4	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		7.5	10.4	65.9				76.3
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		40.0	40.0	60.0				104.5
Max Q Clear Time (g_c+I1), s		2.7	6.4	15.2				6.7
Green Ext Time (p_c), s		0.1	0.3	36.4				63.9

Intersection Summary	
HCM 2010 Ctrl Delay	6.1
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	204	202	97	257	139	383	568	80	88	583	144
Future Volume (veh/h)	86	204	202	97	257	139	383	568	80	88	583	144
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1863	1845	1900	1863	1900	1881	1780	1900	1696	1827	1827
Adj Flow Rate, veh/h	104	246	243	117	310	167	461	684	96	106	702	173
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	6	2	3	0	2	2	1	7	7	12	4	4
Cap, veh/h	132	989	433	150	634	333	632	1109	155	133	1361	414
Arrive On Green	0.08	0.28	0.28	0.08	0.28	0.28	0.18	0.37	0.37	0.08	0.27	0.27
Sat Flow, veh/h	1707	3539	1551	1810	2226	1168	3476	2976	417	1616	4988	1518
Grp Volume(v), veh/h	104	246	243	117	245	232	461	388	392	106	702	173
Grp Sat Flow(s),veh/h/ln	1707	1770	1551	1810	1770	1624	1738	1691	1703	1616	1663	1518
Q Serve(g_s), s	6.2	5.6	13.9	6.6	11.9	12.4	13.0	19.4	19.4	6.7	12.4	9.7
Cycle Q Clear(g_c), s	6.2	5.6	13.9	6.6	11.9	12.4	13.0	19.4	19.4	6.7	12.4	9.7
Prop In Lane	1.00		1.00	1.00		0.72	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	132	989	433	150	504	463	632	630	634	133	1361	414
V/C Ratio(X)	0.79	0.25	0.56	0.78	0.49	0.50	0.73	0.62	0.62	0.80	0.52	0.42
Avail Cap(c_a), veh/h	494	1706	748	785	853	783	1341	630	634	467	2164	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	28.9	31.9	46.6	30.8	31.0	40.0	26.5	26.5	46.8	31.9	30.9
Incr Delay (d2), s/veh	9.9	0.5	4.1	8.5	1.0	1.2	3.5	3.8	3.8	10.5	0.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.8	6.4	3.6	5.9	5.7	6.5	9.7	9.8	3.4	5.7	4.2
LnGrp Delay(d),s/veh	56.9	29.4	36.0	55.1	31.8	32.2	43.5	30.3	30.3	57.2	32.3	31.9
LnGrp LOS	E	C	D	E	C	C	D	C	C	E	C	C
Approach Vol, veh/h		593			594			1241			981	
Approach Delay, s/veh		36.9			36.5			35.2			35.0	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	43.6	12.6	35.0	22.8	33.3	12.0	35.5
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	30.0	45.0	50.0	40.0	45.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	8.7	21.4	8.6	15.9	15.0	14.4	8.2	14.4
Green Ext Time (p_c), s	0.2	7.5	0.3	12.8	3.9	13.9	0.2	13.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	21	71	20	67	31	92	342	62	30	329	40
Future Volume (veh/h)	30	21	71	20	67	31	92	342	62	30	329	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1516	1484	1900	1721	1792	1712	1741	1900	1387	1776	1727
Adj Flow Rate, veh/h	33	23	78	22	74	34	101	376	68	33	362	44
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	33	33	28	9	9	6	11	7	7	37	7	10
Cap, veh/h	145	66	266	101	228	321	129	708	128	47	798	645
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.08	0.49	0.49	0.04	0.45	0.45
Sat Flow, veh/h	186	314	1259	88	1082	1520	1630	1435	260	1321	1776	1436
Grp Volume(v), veh/h	56	0	78	96	0	34	101	0	444	33	362	44
Grp Sat Flow(s),veh/h/ln	500	0	1259	1169	0	1520	1630	0	1695	1321	1776	1436
Q Serve(g_s), s	0.7	0.0	2.8	0.2	0.0	1.0	3.3	0.0	9.7	1.3	7.6	0.9
Cycle Q Clear(g_c), s	9.0	0.0	2.8	8.8	0.0	1.0	3.3	0.0	9.7	1.3	7.6	0.9
Prop In Lane	0.59		1.00	0.23		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	212	0	266	329	0	321	129	0	836	47	798	645
V/C Ratio(X)	0.26	0.00	0.29	0.29	0.00	0.11	0.78	0.00	0.53	0.70	0.45	0.07
Avail Cap(c_a), veh/h	625	0	702	870	0	847	909	0	1259	736	1650	1334
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	17.9	17.9	0.0	17.1	24.3	0.0	9.4	25.7	10.2	8.4
Incr Delay (d2), s/veh	0.8	0.0	0.7	0.6	0.0	0.2	11.2	0.0	1.4	19.6	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.0	1.2	0.0	0.4	1.9	0.0	4.8	0.7	4.0	0.4
LnGrp Delay(d),s/veh	19.5	0.0	18.6	18.4	0.0	17.3	35.5	0.0	10.8	45.3	11.4	8.5
LnGrp LOS	B		B	B		B	D		B	D	B	A
Approach Vol, veh/h		134			130			545			439	
Approach Delay, s/veh		19.0			18.1			15.4			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	32.1		16.2	8.4	29.7		16.2
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	30.0	40.0		30.0	30.0	50.0		30.0
Max Q Clear Time (g_c+I1), s	3.3	11.7		11.0	5.3	9.6		10.8
Green Ext Time (p_c), s	0.1	12.6		1.3	0.3	14.8		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	103	75	386	125	85	45	428	529	140	407	12
Future Volume (veh/h)	23	103	75	386	125	85	45	428	529	140	407	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1881	1900	1845	1836	1863	1863	1792	1863	1827	1779	1900
Adj Flow Rate, veh/h	26	114	83	284	342	94	50	476	588	156	452	13
Adj No. of Lanes	1	2	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	1	3	4	2	2	6	2	4	7	7
Cap, veh/h	147	194	130	391	408	350	65	1457	676	186	1669	48
Arrive On Green	0.10	0.10	0.10	0.22	0.22	0.22	0.04	0.43	0.43	0.11	0.50	0.50
Sat Flow, veh/h	1547	2036	1365	1757	1836	1573	1774	3406	1581	1740	3353	96
Grp Volume(v), veh/h	26	99	98	284	342	94	50	476	588	156	227	238
Grp Sat Flow(s),veh/h/ln	1547	1787	1615	1757	1836	1573	1774	1703	1581	1740	1690	1759
Q Serve(g_s), s	1.9	6.6	7.3	18.7	22.2	6.2	3.5	11.6	42.3	11.0	9.8	9.8
Cycle Q Clear(g_c), s	1.9	6.6	7.3	18.7	22.2	6.2	3.5	11.6	42.3	11.0	9.8	9.8
Prop In Lane	1.00		0.85	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	147	170	154	391	408	350	65	1457	676	186	841	876
V/C Ratio(X)	0.18	0.58	0.64	0.73	0.84	0.27	0.77	0.33	0.87	0.84	0.27	0.27
Avail Cap(c_a), veh/h	347	400	362	844	882	755	284	1635	759	487	841	876
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	54.1	54.5	45.1	46.4	40.2	59.7	23.8	32.6	54.8	18.2	18.2
Incr Delay (d2), s/veh	0.6	3.1	4.4	2.6	4.6	0.4	17.1	0.2	10.4	9.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.4	3.5	9.4	11.8	2.7	2.0	5.5	20.4	5.8	4.6	4.8
LnGrp Delay(d),s/veh	52.6	57.3	58.8	47.7	51.1	40.6	76.8	24.0	42.9	64.5	18.5	18.5
LnGrp LOS	D	E	E	D	D	D	E	C	D	E	B	B
Approach Vol, veh/h		223			720			1114			621	
Approach Delay, s/veh		57.4			48.4			36.3			30.0	
Approach LOS		E			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	17.3	58.4		16.9	8.6	67.2		32.3
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	35.0	60.0		28.0	20.0	60.0		60.0
Max Q Clear Time (g_c+I1), s	13.0	44.3		9.3	5.5	11.8		24.2
Green Ext Time (p_c), s	0.4	9.1		1.1	0.1	18.3		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	749	13	17	604	525	12	16	6	257	11	90
Future Volume (veh/h)	132	749	13	17	604	525	12	16	6	257	11	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1882	1900	1792	1863	1827	1900	1675	1900	1759	1770	1776
Adj Flow Rate, veh/h	152	861	15	20	694	0	14	18	7	304	0	103
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	1	1	6	2	4	0	12	12	8	0	7
Cap, veh/h	180	1433	25	28	1110	487	527	335	130	441	0	197
Arrive On Green	0.10	0.40	0.40	0.02	0.31	0.00	0.29	0.29	0.29	0.13	0.00	0.13
Sat Flow, veh/h	1774	3595	63	1707	3539	1553	1810	1148	446	3351	0	1496
Grp Volume(v), veh/h	152	428	448	20	694	0	14	0	25	304	0	103
Grp Sat Flow(s),veh/h/ln	1774	1787	1870	1707	1770	1553	1810	0	1595	1675	0	1496
Q Serve(g_s), s	10.1	22.7	22.8	1.4	20.1	0.0	0.7	0.0	1.4	10.4	0.0	7.7
Cycle Q Clear(g_c), s	10.1	22.7	22.8	1.4	20.1	0.0	0.7	0.0	1.4	10.4	0.0	7.7
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	180	712	745	28	1110	487	527	0	465	441	0	197
V/C Ratio(X)	0.85	0.60	0.60	0.72	0.63	0.00	0.03	0.00	0.05	0.69	0.00	0.52
Avail Cap(c_a), veh/h	229	712	745	291	1326	582	527	0	465	976	0	436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.1	28.6	28.6	58.8	35.2	0.0	30.4	0.0	30.6	49.8	0.0	48.7
Incr Delay (d2), s/veh	20.3	3.1	3.0	29.6	2.1	0.0	0.1	0.0	0.2	2.7	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	11.8	12.3	0.9	10.2	0.0	0.3	0.0	0.6	5.0	0.0	3.4
LnGrp Delay(d),s/veh	73.3	31.7	31.5	88.4	37.3	0.0	30.5	0.0	30.9	52.6	0.0	51.7
LnGrp LOS	E	C	C	F	D		C		C	D		D
Approach Vol, veh/h		1028			714			39			407	
Approach Delay, s/veh		37.8			38.8			30.7			52.3	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.0	6.4	52.9		20.8	16.7	42.7
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		35.0	20.5	45.0		35.0	15.5	45.0
Max Q Clear Time (g_c+I1), s		3.4	3.4	24.8		12.4	12.1	22.1
Green Ext Time (p_c), s		0.2	0.0	17.3		2.2	0.1	15.6

Intersection Summary	
HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	653	429	352	1004	0	0	0	0	45	0	211
Future Volume (veh/h)	0	653	429	352	1004	0	0	0	0	45	0	211
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1810	1881	1845	0				1827	1827	1900
Adj Flow Rate, veh/h	0	734	482	396	1128	0				51	0	237
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	5	1	3	0				4	0	4
Cap, veh/h	0	1436	623	433	2499	0				313	0	280
Arrive On Green	0.00	0.41	0.41	0.24	0.71	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3632	1535	1792	3597	0				1740	0	1553
Grp Volume(v), veh/h	0	734	482	396	1128	0				51	0	237
Grp Sat Flow(s),veh/h/ln	0	1770	1535	1792	1752	0				1740	0	1553
Q Serve(g_s), s	0.0	13.4	23.4	18.5	11.7	0.0				2.1	0.0	12.7
Cycle Q Clear(g_c), s	0.0	13.4	23.4	18.5	11.7	0.0				2.1	0.0	12.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1436	623	433	2499	0				313	0	280
V/C Ratio(X)	0.00	0.51	0.77	0.91	0.45	0.00				0.16	0.00	0.85
Avail Cap(c_a), veh/h	0	1436	623	521	2499	0				526	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.76	0.76	0.49	0.49	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.2	22.1	31.7	5.2	0.0				29.8	0.0	34.1
Incr Delay (d2), s/veh	0.0	1.0	7.0	9.7	0.3	0.0				0.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	11.1	10.3	5.6	0.0				1.0	0.0	5.7
LnGrp Delay(d),s/veh	0.0	20.1	29.2	41.4	5.5	0.0				29.9	0.0	37.2
LnGrp LOS		C	C	D	A					C		D
Approach Vol, veh/h		1216			1524						288	
Approach Delay, s/veh		23.7			14.8						35.9	
Approach LOS		C			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	26.4	40.0		19.6		66.4		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	25.0	20.4		26.0		51.0		
Max Q Clear Time (g_c+I1), s	20.5	25.4		14.7		13.7		
Green Ext Time (p_c), s	0.3	0.0		0.8		14.7		

Intersection Summary	
HCM 2010 Ctrl Delay	20.4
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	522	0	0	733	54	623	2	834	0	0	0
Future Volume (veh/h)	176	522	0	0	733	54	623	2	834	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1863	0	0	1863	1900	1845	1873	1881			
Adj Flow Rate, veh/h	196	580	0	0	814	60	1018	0	580			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	2	0	0	2	2	3	0	1			
Cap, veh/h	232	1844	0	0	1167	86	1331	0	606			
Arrive On Green	0.13	0.52	0.00	0.00	0.35	0.35	0.38	0.00	0.38			
Sat Flow, veh/h	1757	3632	0	0	3436	246	3514	0	1599			
Grp Volume(v), veh/h	196	580	0	0	431	443	1018	0	580			
Grp Sat Flow(s),veh/h/ln	1757	1770	0	0	1770	1819	1757	0	1599			
Q Serve(g_s), s	9.5	8.2	0.0	0.0	18.2	18.2	22.0	0.0	30.8			
Cycle Q Clear(g_c), s	9.5	8.2	0.0	0.0	18.2	18.2	22.0	0.0	30.8			
Prop In Lane	1.00		0.00	0.00		0.14	1.00		1.00			
Lane Grp Cap(c), veh/h	232	1844	0	0	618	635	1331	0	606			
V/C Ratio(X)	0.85	0.31	0.00	0.00	0.70	0.70	0.76	0.00	0.96			
Avail Cap(c_a), veh/h	303	1844	0	0	618	635	1333	0	607			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.92	0.92	1.00	0.00	1.00			
Uniform Delay (d), s/veh	36.9	11.9	0.0	0.0	24.4	24.4	23.6	0.0	26.3			
Incr Delay (d2), s/veh	11.2	0.4	0.0	0.0	6.0	5.8	2.9	0.0	26.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.3	4.0	0.0	0.0	9.9	10.1	11.1	0.0	18.0			
LnGrp Delay(d),s/veh	48.1	12.3	0.0	0.0	30.3	30.2	26.5	0.0	52.7			
LnGrp LOS	D	B			C	C	C		D			
Approach Vol, veh/h		776			874			1598				
Approach Delay, s/veh		21.3			30.2			36.0				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		49.9			15.0	35.0		37.1
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		45.0			15.0	26.5		33.0
Max Q Clear Time (g_c+I1), s		10.2			11.5	20.2		32.8
Green Ext Time (p_c), s		7.7			0.1	3.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1261	61	10	646	0	140	0	25	0	0	0
Future Volume (veh/h)	49	1261	61	10	646	0	140	0	25	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1873	1900	1583	1863	0	1845	0	1638			
Adj Flow Rate, veh/h	56	1449	70	11	743	0	161	0	29			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Percent Heavy Veh, %	0	1	1	20	2	0	3	0	16			
Cap, veh/h	101	2364	114	17	2264	0	211	0	167			
Arrive On Green	0.06	0.68	0.68	0.01	0.64	0.00	0.12	0.00	0.12			
Sat Flow, veh/h	1810	3453	166	1508	3632	0	1757	0	1392			
Grp Volume(v), veh/h	56	745	774	11	743	0	161	0	29			
Grp Sat Flow(s),veh/h/ln	1810	1780	1839	1508	1770	0	1757	0	1392			
Q Serve(g_s), s	2.2	16.6	16.8	0.5	7.0	0.0	6.5	0.0	1.4			
Cycle Q Clear(g_c), s	2.2	16.6	16.8	0.5	7.0	0.0	6.5	0.0	1.4			
Prop In Lane	1.00		0.09	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	101	1218	1259	17	2264	0	211	0	167			
V/C Ratio(X)	0.56	0.61	0.61	0.67	0.33	0.00	0.76	0.00	0.17			
Avail Cap(c_a), veh/h	619	1218	1259	516	2420	0	601	0	476			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.6	6.3	6.3	36.0	6.0	0.0	31.2	0.0	28.9			
Incr Delay (d2), s/veh	4.7	1.6	1.6	37.6	0.2	0.0	5.7	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	8.6	8.9	0.4	3.5	0.0	3.5	0.0	0.5			
LnGrp Delay(d),s/veh	38.3	7.8	7.8	73.6	6.2	0.0	36.9	0.0	29.4			
LnGrp LOS	D	A	A	E	A		D		C			
Approach Vol, veh/h		1575			754			190				
Approach Delay, s/veh		8.9			7.2			35.7				
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.8	55.1			8.1	51.8		13.3
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	25.0	50.0			25.0	50.0		25.0
Max Q Clear Time (g_c+I1), s	2.5	18.8			4.2	9.0		8.5
Green Ext Time (p_c), s	0.0	29.4			0.1	37.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	553	958	4
Future Vol, veh/h	0	0	16	553	958	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	582	1008	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	506	1013	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	517	692	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	517	692	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	692	-	-	-	-
HCM Lane V/C Ratio	0.024	-	-	-	-
HCM Control Delay (s)	10.3	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	49	45	65	149	231	79
Future Vol, veh/h	49	45	65	149	231	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	49	71	162	251	86

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	516	168	337	0	-	0
Stage 1	294	-	-	-	-	-
Stage 2	222	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	489	847	1219	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	461	847	1219	-	-	-
Mov Cap-2 Maneuver	461	-	-	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1219	-	461	847	-	-
HCM Lane V/C Ratio	0.058	-	0.116	0.058	-	-
HCM Control Delay (s)	8.1	-	13.8	9.5	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	524	694	39	12	398	135	151	13	17	12	4	63
Future Volume (veh/h)	524	694	39	12	398	135	151	13	17	12	4	63
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	570	754	42	13	433	147	164	14	18	13	4	68
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	599	1295	72	422	758	255	210	88	113	81	25	94
Arrive On Green	0.34	0.38	0.38	0.24	0.29	0.29	0.12	0.12	0.12	0.06	0.06	0.06
Sat Flow, veh/h	1774	3409	190	1774	2602	875	1774	741	953	1372	422	1583
Grp Volume(v), veh/h	570	391	405	13	293	287	164	0	32	17	0	68
Grp Sat Flow(s),veh/h/ln	1774	1770	1829	1774	1770	1708	1774	0	1695	1794	0	1583
Q Serve(g_s), s	27.5	15.5	15.5	0.5	12.4	12.6	7.9	0.0	1.5	0.8	0.0	3.7
Cycle Q Clear(g_c), s	27.5	15.5	15.5	0.5	12.4	12.6	7.9	0.0	1.5	0.8	0.0	3.7
Prop In Lane	1.00		0.10	1.00		0.51	1.00		0.56	0.76		1.00
Lane Grp Cap(c), veh/h	599	672	695	422	515	497	210	0	200	106	0	94
V/C Ratio(X)	0.95	0.58	0.58	0.03	0.57	0.58	0.78	0.00	0.16	0.16	0.00	0.72
Avail Cap(c_a), veh/h	606	1209	1250	606	1209	1167	606	0	579	613	0	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	21.7	21.7	25.7	26.4	26.5	37.6	0.0	34.8	39.2	0.0	40.6
Incr Delay (d2), s/veh	24.9	2.9	2.8	0.0	3.6	3.8	6.3	0.0	0.4	0.7	0.0	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.6	8.0	8.3	0.2	6.5	6.4	4.2	0.0	0.7	0.4	0.0	1.9
LnGrp Delay(d),s/veh	53.3	24.6	24.5	25.7	30.0	30.3	43.9	0.0	35.2	39.9	0.0	50.7
LnGrp LOS	D	C	C	C	C	C	D		D	D		D
Approach Vol, veh/h		1366			593			196			85	
Approach Delay, s/veh		36.5			30.1			42.5			48.5	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.9	38.4		14.4	33.7	30.6		9.2
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	30.0	* 60		30.0	30.0	60.0		30.0
Max Q Clear Time (g_c+I1), s	2.5	17.5		9.9	29.5	14.6		5.7
Green Ext Time (p_c), s	9.2	15.9		0.6	0.1	11.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	35.8
HCM 2010 LOS	D

Notes

Intersection	
Intersection Delay, s/veh	22.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	250	491	144	228	0	210	0	45	1	0	1
Future Vol, veh/h	0	250	491	144	228	0	210	0	45	1	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	13	5	7	13	0	9	0	4	0	0	0
Mvmt Flow	0	278	546	160	253	0	233	0	50	1	0	1
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	27.7	15.3	17.8	11.2
HCM LOS	D	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	50%
Vol Thru, %	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	100%	0%	100%	0%	0%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	210	45	250	491	144	228	2
LT Vol	210	0	0	0	144	0	1
Through Vol	0	0	250	0	0	228	0
RT Vol	0	45	0	491	0	0	1
Lane Flow Rate	233	50	278	546	160	253	2
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.522	0.093	0.504	0.861	0.327	0.49	0.005
Departure Headway (Hd)	8.056	6.674	6.53	5.68	7.367	6.961	8.187
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	446	534	550	633	485	514	440
Service Time	5.833	4.45	4.303	3.452	5.153	4.747	6.187
HCM Lane V/C Ratio	0.522	0.094	0.505	0.863	0.33	0.492	0.005
HCM Control Delay	19.4	10.1	15.8	33.8	13.7	16.3	11.2
HCM Lane LOS	C	B	C	D	B	C	B
HCM 95th-tile Q	2.9	0.3	2.8	9.8	1.4	2.7	0

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	74	292	3	98	778
Future Vol, veh/h	1	74	292	3	98	778
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	9	0	1	3
Mvmt Flow	1	81	321	3	108	855

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1393	323	0	0	324	0
Stage 1	323	-	-	-	-	-
Stage 2	1070	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	158	723	-	-	1241	-
Stage 1	738	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	723	-	-	1241	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	303	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	686	1241	-
HCM Lane V/C Ratio	-	-	0.12	0.087	-
HCM Control Delay (s)	-	-	11	8.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.3	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	33	2	3	2	292	25	3	789	2
Future Vol, veh/h	1	1	1	33	2	3	2	292	25	3	789	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	1	1	1	39	2	4	2	344	29	4	928	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1285	1284	929	1285	1286	344	931	0	0	344	0	0
Stage 1	936	936	-	348	348	-	-	-	-	-	-	-
Stage 2	349	348	-	937	938	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	143	166	327	143	166	703	743	-	-	1226	-	-
Stage 1	321	346	-	672	638	-	-	-	-	-	-	-
Stage 2	671	638	-	320	346	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	140	165	327	141	165	703	743	-	-	1226	-	-
Mov Cap-2 Maneuver	140	165	-	141	165	-	-	-	-	-	-	-
Stage 1	320	345	-	670	636	-	-	-	-	-	-	-
Stage 2	663	636	-	317	345	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.8	38	0.1	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	743	-	-	151	327	142	703	1226	-	-
HCM Lane V/C Ratio	0.003	-	-	0.016	0.004	0.29	0.005	0.003	-	-
HCM Control Delay (s)	9.9	-	-	29.2	16	40.4	10.1	7.9	-	-
HCM Lane LOS	A	-	-	D	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	1.1	0	0	-	-

Intersection	
Intersection Delay, s/veh	21.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	22	179	103	26	10	80	156	24	5	279	99
Future Vol, veh/h	97	22	179	103	26	10	80	156	24	5	279	99
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	4	9	6	0	0	0	5	8	4	0	3	8
Mvmt Flow	120	27	221	127	32	12	99	193	30	6	344	122
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	17	18.9	18.4	27.7
HCM LOS	C	C	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	82%	0%	74%	100%	0%	0%
Vol Thru, %	0%	87%	18%	0%	19%	0%	100%	0%
Vol Right, %	0%	13%	0%	100%	7%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	180	119	179	139	5	279	99
LT Vol	80	0	97	0	103	5	0	0
Through Vol	0	156	22	0	26	0	279	0
RT Vol	0	24	0	179	10	0	0	99
Lane Flow Rate	99	222	147	221	172	6	344	122
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.247	0.521	0.359	0.476	0.437	0.015	0.773	0.253
Departure Headway (Hd)	9.01	8.447	8.806	7.757	9.176	8.546	8.084	7.451
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	399	427	408	464	393	421	451	485
Service Time	6.762	6.199	6.557	5.508	6.933	6.246	5.784	5.151
HCM Lane V/C Ratio	0.248	0.52	0.36	0.476	0.438	0.014	0.763	0.252
HCM Control Delay	14.7	20.1	16.4	17.4	18.9	11.4	33.3	12.7
HCM Lane LOS	B	C	C	C	C	B	D	B
HCM 95th-tile Q	1	2.9	1.6	2.5	2.2	0	6.7	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	17	270	579	0
Future Vol, veh/h	0	9	17	270	579	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	6	5	0
Mvmt Flow	0	12	23	365	782	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1193	782	782	0	-	0
Stage 1	782	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	208	397	845	-	-	-
Stage 1	454	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	202	397	845	-	-	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	454	-	-	-	-	-
Stage 2	656	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	845	-	397	-	-
HCM Lane V/C Ratio	0.027	-	0.031	-	-
HCM Control Delay (s)	9.4	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	44.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	78	114	173	108	242	346
Future Vol, veh/h	78	114	173	108	242	346
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	0	0	4	2	5	4
Mvmt Flow	110	161	244	152	341	487

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1489	320	0	0	396	0
Stage 1	320	-	-	-	-	-
Stage 2	1169	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	138	725	-	-	1146	-
Stage 1	741	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 97	725	-	-	1146	-
Mov Cap-2 Maneuver	~ 97	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	209	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	233.5	0	3.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	200	1146	-
HCM Lane V/C Ratio	-	-	1.352	0.297	-
HCM Control Delay (s)	-	-	233.5	9.5	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	15.4	1.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	67	234	113	150	329
Future Vol, veh/h	30	67	234	113	150	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	0	0	3	1	0	2
Mvmt Flow	50	112	390	188	250	548

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1532	484	0	0	578	0
Stage 1	484	-	-	-	-	-
Stage 2	1048	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	130	587	-	-	1006	-
Stage 1	624	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	98	587	-	-	1006	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	256	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.9	0	3.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	98	587	1006	-
HCM Lane V/C Ratio	-	-	0.51	0.19	0.249	-
HCM Control Delay (s)	-	-	75	12.6	9.8	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.7	1	-

Intersection	
Int Delay, s/veh	64.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	127	0	103	3	244	129	109	246	4
Future Vol, veh/h	0	0	3	127	0	103	3	244	129	109	246	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	2	0
Mvmt Flow	0	0	4	187	0	151	4	359	190	160	362	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1223	1242	365	1151	1151	454	368	0	0	549	0	0
Stage 1	685	685	-	463	463	-	-	-	-	-	-	-
Stage 2	538	557	-	688	688	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	158	176	685	~ 177	200	610	1202	-	-	1031	-	-
Stage 1	441	451	-	583	568	-	-	-	-	-	-	-
Stage 2	531	515	-	440	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	104	148	685	~ 155	168	610	1202	-	-	1031	-	-
Mov Cap-2 Maneuver	104	148	-	~ 155	168	-	-	-	-	-	-	-
Stage 1	440	381	-	581	566	-	-	-	-	-	-	-
Stage 2	398	513	-	369	380	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	265	0.1	2.8
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	685	233	1031	-	-
HCM Lane V/C Ratio	0.004	-	-	0.006	1.452	0.155	-	-
HCM Control Delay (s)	8	-	-	10.3	265	9.1	-	-
HCM Lane LOS	A	-	-	B	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	19.6	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	8.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	161	60	316	304	111	265
Future Vol, veh/h	161	60	316	304	111	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	3	1	1	2
Mvmt Flow	218	81	427	411	150	358

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1290	632	0	0	838	0
Stage 1	632	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	~ 182	484	-	-	801	-
Stage 1	534	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 148	484	-	-	801	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	422	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	40.9	0	3.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	281	484	801	-
HCM Lane V/C Ratio	-	-	0.774	0.168	0.187	-
HCM Control Delay (s)	-	-	50.9	13.9	10.5	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	5.9	0.6	0.7	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	37	55	602	446	0
Future Vol, veh/h	1	37	55	602	446	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	19	9	3	3	0
Mvmt Flow	1	50	74	814	603	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1565	603	603	0	-	0
Stage 1	603	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Critical Hdwy	6.4	6.39	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.471	2.281	-	-	-
Pot Cap-1 Maneuver	124	469	941	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	114	469	941	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	345	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	941	-	458	-	-
HCM Lane V/C Ratio	0.079	-	0.112	-	-
HCM Control Delay (s)	9.2	-	13.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	183	1	1	15	127	678	5	22	594	20
Future Vol, veh/h	0	0	183	1	1	15	127	678	5	22	594	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	7	3	4	0	0	6	20
Mvmt Flow	0	0	193	1	1	16	134	714	5	23	625	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	625	1656	1656	716	625	0	0	719	0	0
Stage 1	-	-	-	984	984	-	-	-	-	-	-	-
Stage 2	-	-	-	672	672	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.1	6.5	6.27	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.5	4	3.363	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	485	79	99	422	952	-	-	892	-	-
Stage 1	0	0	-	302	329	-	-	-	-	-	-	-
Stage 2	0	0	-	449	458	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	485	42	83	422	952	-	-	892	-	-
Mov Cap-2 Maneuver	-	-	-	42	83	-	-	-	-	-	-	-
Stage 1	-	-	-	259	283	-	-	-	-	-	-	-
Stage 2	-	-	-	264	446	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	21.4	1.5	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	952	-	-	485	238	892	-	-
HCM Lane V/C Ratio	0.14	-	-	0.397	0.075	0.026	-	-
HCM Control Delay (s)	9.4	-	-	17.2	21.4	9.1	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.9	0.2	0.1	-	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	118	343	112	99	49	284	325	146	48	262	81
Future Volume (veh/h)	59	118	343	112	99	49	284	325	146	48	262	81
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1845	1827	1815	1900	1759	1845	1845	1863	1826	1900
Adj Flow Rate, veh/h	66	133	385	126	111	55	319	365	164	54	294	91
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	4	3	4	6	6	8	3	3	2	5	5
Cap, veh/h	474	502	422	244	160	79	356	653	547	70	454	137
Arrive On Green	0.27	0.27	0.27	0.14	0.14	0.14	0.21	0.35	0.35	0.04	0.18	0.18
Sat Flow, veh/h	1723	1827	1534	1740	1139	565	1675	1845	1544	1774	2590	781
Grp Volume(v), veh/h	66	133	385	126	0	166	319	365	164	54	194	191
Grp Sat Flow(s),veh/h/ln	1723	1827	1534	1740	0	1704	1675	1845	1544	1774	1735	1637
Q Serve(g_s), s	2.6	5.2	22.2	6.1	0.0	8.5	16.9	14.6	7.0	2.8	9.5	9.9
Cycle Q Clear(g_c), s	2.6	5.2	22.2	6.1	0.0	8.5	16.9	14.6	7.0	2.8	9.5	9.9
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	474	502	422	244	0	239	356	653	547	70	304	287
V/C Ratio(X)	0.14	0.26	0.91	0.52	0.00	0.69	0.90	0.56	0.30	0.78	0.64	0.66
Avail Cap(c_a), veh/h	527	559	470	533	0	522	458	807	675	495	758	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	25.9	32.1	36.4	0.0	37.4	35.0	23.8	21.3	43.5	35.0	35.2
Incr Delay (d2), s/veh	0.0	0.1	19.9	0.6	0.0	1.4	16.7	0.3	0.1	6.7	0.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.6	11.7	3.0	0.0	4.1	9.5	7.5	3.0	1.5	4.6	4.6
LnGrp Delay(d),s/veh	25.1	26.0	52.0	37.1	0.0	38.8	51.7	24.1	21.5	50.3	35.9	36.2
LnGrp LOS	C	C	D	D		D	D	C	C	D	D	D
Approach Vol, veh/h		584			292			848			439	
Approach Delay, s/veh		43.0			38.0			34.0			37.8	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	37.9		29.1	24.0	21.5		16.9
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	25.5	40.0		28.0	25.0	40.0		28.0
Max Q Clear Time (g_c+I1), s	4.8	16.6		24.2	18.9	11.9		10.5
Green Ext Time (p_c), s	0.0	3.4		0.6	0.5	3.5		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	37.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	27	16	71	14	450	22	435	80	388	454	12
Future Volume (veh/h)	11	27	16	71	14	450	22	435	80	388	454	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1839	1845	1900	1845	1827	1863	1864	1900
Adj Flow Rate, veh/h	12	29	17	76	15	479	23	463	85	413	483	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	3	0	3	4	2	2	2
Cap, veh/h	113	245	122	398	70	773	28	608	506	417	991	27
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.02	0.33	0.33	0.23	0.55	0.55
Sat Flow, veh/h	192	946	472	1162	270	1562	1810	1845	1534	1774	1805	49
Grp Volume(v), veh/h	58	0	0	91	0	479	23	463	85	413	0	496
Grp Sat Flow(s),veh/h/ln	1609	0	0	1432	0	1562	1810	1845	1534	1774	0	1853
Q Serve(g_s), s	0.0	0.0	0.0	1.4	0.0	15.2	0.9	15.3	2.7	15.8	0.0	11.2
Cycle Q Clear(g_c), s	1.7	0.0	0.0	3.0	0.0	15.2	0.9	15.3	2.7	15.8	0.0	11.2
Prop In Lane	0.21		0.29	0.84		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	481	0	0	468	0	773	28	608	506	417	0	1018
V/C Ratio(X)	0.12	0.00	0.00	0.19	0.00	0.62	0.82	0.76	0.17	0.99	0.00	0.49
Avail Cap(c_a), veh/h	532	0	0	486	0	793	425	975	811	417	0	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	0.0	19.7	0.0	12.6	33.4	20.4	16.2	26.0	0.0	9.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	1.4	18.8	2.0	0.2	41.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.4	0.0	6.8	0.6	8.1	1.2	12.5	0.0	5.8
LnGrp Delay(d),s/veh	19.4	0.0	0.0	19.9	0.0	14.0	52.2	22.4	16.4	67.5	0.0	9.8
LnGrp LOS	B			B		B	D	C	B	E		A
Approach Vol, veh/h		58			570			571			909	
Approach Delay, s/veh		19.4			14.9			22.7			36.0	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	26.5		21.6	5.1	41.4		21.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	36.0		20.0	16.0	36.0		18.5
Max Q Clear Time (g_c+I1), s	17.8	17.3		3.7	2.9	13.2		17.2
Green Ext Time (p_c), s	0.0	5.2		2.5	0.0	7.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Future Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1869	1900	1881	1876	1900	1827	1853	1900	1900	1845	1863
Adj Flow Rate, veh/h	63	52	81	112	37	64	112	472	134	49	203	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	0	0	4	3	3	0	3	2
Cap, veh/h	136	112	220	250	86	149	158	816	230	96	486	417
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.09	0.30	0.30	0.05	0.26	0.00
Sat Flow, veh/h	997	823	1615	1792	618	1069	1740	2713	765	1810	1845	1583
Grp Volume(v), veh/h	115	0	81	112	0	101	112	305	301	49	203	0
Grp Sat Flow(s),veh/h/ln	1819	0	1615	1792	0	1688	1740	1760	1718	1810	1845	1583
Q Serve(g_s), s	2.3	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Cycle Q Clear(g_c), s	2.3	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Prop In Lane	0.55		1.00	1.00		0.63	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	248	0	220	250	0	235	158	529	517	96	486	417
V/C Ratio(X)	0.46	0.00	0.37	0.45	0.00	0.43	0.71	0.58	0.58	0.51	0.42	0.00
Avail Cap(c_a), veh/h	1413	0	1255	1160	0	1092	901	1823	1779	937	1911	1640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.4	0.0	15.2	15.2	0.0	15.2	17.1	11.4	11.4	17.8	11.8	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.4	0.5	0.0	0.5	2.2	0.5	0.6	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.8	1.1	0.0	1.0	1.2	2.8	2.8	0.5	1.8	0.0
LnGrp Delay(d),s/veh	15.9	0.0	15.5	15.7	0.0	15.7	19.3	12.0	12.0	19.4	12.1	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		196			213			718			252	
Approach Delay, s/veh		15.7			15.7			13.1			13.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	15.3		8.8	6.5	13.9		9.5
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		25.0
Max Q Clear Time (g_c+I1), s	3.0	7.7		4.3	4.4	5.5		4.2
Green Ext Time (p_c), s	0.0	3.9		0.5	0.1	3.9		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	30.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	122	426	249	88	123	249
Future Vol, veh/h	122	426	249	88	123	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	3	3	2	4	1
Mvmt Flow	131	458	268	95	132	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	800	268	0	0	268	0
Stage 1	268	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.41	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	356	768	-	-	1284	-
Stage 1	779	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	313	768	-	-	1284	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.2	0	2.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	580	1284	-
HCM Lane V/C Ratio	-	-	1.016	0.103	-
HCM Control Delay (s)	-	-	68.2	8.1	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	15.5	0.3	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	118	29	51	127	41	82
Future Vol, veh/h	118	29	51	127	41	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	6	5	4
Mvmt Flow	128	32	55	138	45	89

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	160	0	393	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	249	-
Critical Hdwy	-	-	4.12	-	6.45	6.24
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.336
Pot Cap-1 Maneuver	-	-	1419	-	606	898
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	785	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1419	-	581	898
Mov Cap-2 Maneuver	-	-	-	-	581	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	752	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	760	-	-	1419	-
HCM Lane V/C Ratio	0.176	-	-	0.039	-
HCM Control Delay (s)	10.7	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	265	148	266	273	44	116	667	240	23	431	96
Future Volume (veh/h)	113	265	148	266	273	44	116	667	240	23	431	96
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1827	1845	1845	1863	1810	1810	1881	1845	1743	1863	1810
Adj Flow Rate, veh/h	127	298	166	299	307	49	130	749	270	26	484	108
Adj No. of Lanes	1	1	1	2	1	1	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	4	3	3	2	5	5	1	3	9	2	5
Cap, veh/h	160	434	372	393	490	396	163	787	836	35	642	530
Arrive On Green	0.09	0.24	0.24	0.12	0.26	0.26	0.09	0.42	0.42	0.02	0.34	0.34
Sat Flow, veh/h	1792	1827	1568	3408	1863	1505	1723	1881	1568	1660	1863	1538
Grp Volume(v), veh/h	127	298	166	299	307	49	130	749	270	26	484	108
Grp Sat Flow(s),veh/h/ln	1792	1827	1568	1704	1863	1505	1723	1881	1568	1660	1863	1538
Q Serve(g_s), s	6.7	14.3	8.7	8.2	14.0	2.4	7.1	37.0	9.3	1.5	22.1	4.8
Cycle Q Clear(g_c), s	6.7	14.3	8.7	8.2	14.0	2.4	7.1	37.0	9.3	1.5	22.1	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	434	372	393	490	396	163	787	836	35	642	530
V/C Ratio(X)	0.79	0.69	0.45	0.76	0.63	0.12	0.80	0.95	0.32	0.75	0.75	0.20
Avail Cap(c_a), veh/h	373	571	490	887	679	549	449	787	836	346	679	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	33.4	31.2	41.2	31.2	26.9	42.6	27.0	12.6	46.8	27.9	22.2
Incr Delay (d2), s/veh	8.5	4.3	1.8	3.1	2.8	0.3	8.6	21.6	0.5	27.3	5.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	7.7	3.9	4.0	7.5	1.0	3.8	23.9	4.1	0.9	12.3	2.1
LnGrp Delay(d),s/veh	51.3	37.7	33.0	44.3	34.0	27.2	51.2	48.6	13.1	74.1	33.5	22.6
LnGrp LOS	D	D	C	D	C	C	D	D	B	E	C	C
Approach Vol, veh/h		591			655			1149			618	
Approach Delay, s/veh		39.3			38.2			40.5			33.3	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	45.7	15.6	28.3	13.6	38.6	13.1	30.8
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	20.0	40.0	25.0	30.0	25.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	3.5	39.0	10.2	16.3	9.1	24.1	8.7	16.0
Green Ext Time (p_c), s	0.0	1.0	0.9	6.5	0.3	9.0	0.2	8.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.3
HCM 2010 LOS	D

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	112	0	106	0	919	116	99	746	0
Future Volume (vph)	0	0	142	112	0	106	0	919	116	99	746	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.98		1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1601	1765		1553		3487		1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1601	1765		1553		3487		1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	117	0	110	0	957	121	103	777	0
RTOR Reduction (vph)	0	0	127	0	0	94	0	8	0	0	0	0
Lane Group Flow (vph)	0	0	21	117	0	16	0	1070	0	103	777	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	
Protected Phases								6		5	2	
Permitted Phases			4	8		8						
Actuated Green, G (s)			8.3	8.3		8.3		31.4		5.4	40.8	
Effective Green, g (s)			8.3	8.3		8.3		31.4		5.4	40.8	
Actuated g/C Ratio			0.14	0.14		0.14		0.54		0.09	0.70	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			226	249		219		1868		164	2464	
v/s Ratio Prot								c0.31		c0.06	0.22	
v/s Ratio Perm			0.01	c0.07		0.01						
v/c Ratio			0.09	0.47		0.07		0.57		0.63	0.32	
Uniform Delay, d1			21.9	23.1		21.8		9.1		25.6	3.5	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			0.2	1.9		0.2		0.5		5.3	0.1	
Delay (s)			22.1	25.0		22.0		9.6		30.9	3.6	
Level of Service			C	C		C		A		C	A	
Approach Delay (s)		22.1			23.6			9.6			6.8	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	26	288	107	24	33	218	858	69	61	878	80
Future Volume (veh/h)	167	26	288	107	24	33	218	858	69	61	878	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1863	1863	1863	1881
Adj Flow Rate, veh/h	178	28	306	114	26	35	232	913	73	65	934	85
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	217	263	394	146	195	163	273	1946	870	85	1555	693
Arrive On Green	0.12	0.14	0.14	0.08	0.11	0.11	0.16	0.55	0.55	0.05	0.44	0.44
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	3539	1582	1774	3539	1577
Grp Volume(v), veh/h	178	28	306	114	26	35	232	913	73	65	934	85
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1770	1582	1774	1770	1577
Q Serve(g_s), s	9.3	1.3	10.5	6.2	1.3	2.0	12.7	15.2	2.1	3.5	19.5	3.1
Cycle Q Clear(g_c), s	9.3	1.3	10.5	6.2	1.3	2.0	12.7	15.2	2.1	3.5	19.5	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	217	263	394	146	195	163	273	1946	870	85	1555	693
V/C Ratio(X)	0.82	0.11	0.78	0.78	0.13	0.21	0.85	0.47	0.08	0.77	0.60	0.12
Avail Cap(c_a), veh/h	559	565	845	543	565	471	799	1946	870	366	1824	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	36.1	40.0	43.6	39.3	39.6	39.7	13.2	10.3	45.7	20.7	16.1
Incr Delay (d2), s/veh	7.4	0.2	3.3	8.8	0.3	0.7	7.3	0.4	0.1	13.3	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.7	4.1	3.4	0.6	0.9	6.6	7.5	0.9	2.0	9.6	1.4
LnGrp Delay(d),s/veh	49.1	36.3	43.4	52.4	39.6	40.3	47.0	13.6	10.4	59.0	21.5	16.3
LnGrp LOS	D	D	D	D	D	D	D	B	B	E	C	B
Approach Vol, veh/h		512			175			1218			1084	
Approach Delay, s/veh		45.0			48.1			19.8			23.4	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	58.4	12.1	18.0	19.4	47.6	15.7	14.4
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	5.5	17.2	8.2	12.5	14.7	21.5	11.3	4.0
Green Ext Time (p_c), s	0.1	27.5	0.3	1.5	0.7	21.1	0.4	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	0	113	456	104	196	272	913	262	0	1169	94
Future Volume (veh/h)	77	0	113	456	104	196	272	913	262	0	1169	94
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1845	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	82	0	120	485	184	160	289	971	279	0	1244	100
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	106	0	0	586	248	207	333	3020	950	0	1734	567
Arrive On Green	0.06	0.00	0.00	0.17	0.13	0.13	0.19	0.60	0.60	0.00	0.35	0.35
Sat Flow, veh/h	1810	82		3514	1845	1538	1792	5036	1583	0	5055	1599
Grp Volume(v), veh/h	82	37.2		485	184	160	289	971	279	0	1244	100
Grp Sat Flow(s),veh/h/ln	1810	D		1757	1845	1538	1792	1679	1583	0	1631	1599
Q Serve(g_s), s	3.2			9.4	6.8	7.1	11.1	6.7	6.0	0.0	15.5	3.0
Cycle Q Clear(g_c), s	3.2			9.4	6.8	7.1	11.1	6.7	6.0	0.0	15.5	3.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	106			586	248	207	333	3020	950	0	1734	567
V/C Ratio(X)	0.77			0.83	0.74	0.77	0.87	0.32	0.29	0.00	0.72	0.18
Avail Cap(c_a), veh/h	513			2962	915	763	762	4938	1553	0	2427	793
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	32.8			28.4	29.3	29.5	27.9	7.0	6.9	0.0	19.7	15.7
Incr Delay (d2), s/veh	4.4			1.2	1.6	2.3	2.7	0.0	0.1	0.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7			4.7	3.5	3.2	5.7	3.1	2.6	0.0	7.0	1.3
LnGrp Delay(d),s/veh	37.2			29.6	31.0	31.8	30.6	7.0	6.9	0.0	20.0	15.7
LnGrp LOS	D			C	C	C	C	A	A		B	B
Approach Vol, veh/h					829			1539			1344	
Approach Delay, s/veh					30.3			11.4			19.7	
Approach LOS					C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		48.0	16.2		17.3	30.7	8.2	14.3
Change Period (Y+Rc), s		5.7	4.4		* 4.2	5.7	4.1	4.8
Max Green Setting (Gmax), s		69.2	59.5		* 30	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s		8.7	11.4		13.1	17.5	5.2	9.1
Green Ext Time (p_c), s		9.5	0.4		0.1	7.5	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	389	225	60	105	0	311	0	1288	88	280	770	348
Future Volume (veh/h)	389	225	60	105	0	311	0	1288	88	280	770	348
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1881	0	1881	0	1827	1900	1881	1845	1881
Adj Flow Rate, veh/h	409	237	63	111	0	327	0	1356	93	295	811	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	1	0	1	0	4	0	1	3	1
Cap, veh/h	576	389	170	183	0	0	0	2260	581	415	1933	882
Arrive On Green	0.17	0.11	0.11	0.10	0.00	0.00	0.00	0.36	0.36	0.12	0.55	0.00
Sat Flow, veh/h	3442	3610	1583	1792	111		0	6540	1615	3476	3505	1599
Grp Volume(v), veh/h	409	237	63	111	25.5		0	1356	93	295	811	0
Grp Sat Flow(s),veh/h/ln	1721	1805	1583	1792	C		0	1571	1615	1738	1752	1599
Q Serve(g_s), s	6.3	3.5	2.1	3.4			0.0	10.0	2.2	4.6	7.6	0.0
Cycle Q Clear(g_c), s	6.3	3.5	2.1	3.4			0.0	10.0	2.2	4.6	7.6	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	576	389	170	183			0	2260	581	415	1933	882
V/C Ratio(X)	0.71	0.61	0.37	0.61			0.00	0.60	0.16	0.71	0.42	0.00
Avail Cap(c_a), veh/h	3043	2235	980	1267			0	5002	1285	1537	4593	2096
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	24.1	23.4	24.3			0.0	14.8	12.3	24.0	7.4	0.0
Incr Delay (d2), s/veh	1.2	0.6	0.5	1.2			0.0	0.1	0.0	0.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	1.8	0.9	1.7			0.0	4.3	1.0	2.3	3.6	0.0
LnGrp Delay(d),s/veh	23.5	24.7	23.9	25.5			0.0	14.9	12.4	24.8	7.5	0.0
LnGrp LOS	C	C	C	C				B	B	C	A	
Approach Vol, veh/h		709						1449			1106	
Approach Delay, s/veh		23.9						14.7			12.1	
Approach LOS		C						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	10.8	26.0	9.5	10.2		36.9	13.6	
Change Period (Y+Rc), s	4.1	5.7	3.7	4.1		5.7	4.1	
Max Green Setting (Gmax), s	25.0	45.0	40.0	35.0		74.1	50.0	
Max Q Clear Time (g_c+I1), s	6.6	12.0	5.4	5.5		9.6	8.3	
Green Ext Time (p_c), s	0.2	8.4	0.0	0.6		8.8	1.1	

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Notes

HCM Unsignalized Intersection Capacity Analysis
11: Sierra College Blvd & Schriber Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	94	1284	64	0	935
Future Volume (Veh/h)	0	94	1284	64	0	935
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	102	1396	70	0	1016
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			443			404
pX, platoon unblocked	0.93	0.89			0.89	
vC, conflicting volume	1940	385			1467	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	967	0			900	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	238	966			678	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	102	399	399	399	269	508	508
Volume Left	0	0	0	0	0	0	0
Volume Right	102	0	0	0	70	0	0
cSH	966	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.23	0.23	0.23	0.16	0.30	0.30
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.2	0.0				0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	1	75	0	11	2	1332	56	26	910	1
Future Volume (veh/h)	5	0	1	75	0	11	2	1332	56	26	910	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1776	1900	1900	1900	1863	1863	1696	1881	1900
Adj Flow Rate, veh/h	5	0	1	82	0	12	2	1448	61	28	989	1
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	7	0	0	0	2	2	12	1	0
Cap, veh/h	12	0	2	164	85	72	5	3512	1093	46	2560	1156
Arrive On Green	0.01	0.00	0.00	0.05	0.00	0.04	0.00	0.69	0.69	0.03	0.72	0.72
Sat Flow, veh/h	1810	0	1615	3281	1900	1615	1810	5085	1582	1616	3574	1614
Grp Volume(v), veh/h	5	0	1	82	0	12	2	1448	61	28	989	1
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1640	1900	1615	1810	1695	1582	1616	1787	1614
Q Serve(g_s), s	0.2	0.0	0.1	2.1	0.0	0.6	0.1	10.6	1.1	1.5	9.4	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.1	2.1	0.0	0.6	0.1	10.6	1.1	1.5	9.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	12	0	2	164	85	72	5	3512	1093	46	2560	1156
V/C Ratio(X)	0.42	0.00	0.45	0.50	0.00	0.17	0.41	0.41	0.06	0.61	0.39	0.00
Avail Cap(c_a), veh/h	630	0	750	1143	882	750	630	3542	1102	1125	3734	1686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	0.0	43.0	39.9	0.0	39.6	42.9	5.8	4.3	41.4	4.8	3.5
Incr Delay (d2), s/veh	22.1	0.0	117.9	2.4	0.0	1.3	46.4	0.1	0.0	12.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	1.0	0.0	0.3	0.1	4.9	0.5	0.8	4.6	0.0
LnGrp Delay(d),s/veh	64.7	0.0	160.8	42.2	0.0	40.9	89.3	5.9	4.3	53.9	4.9	3.5
LnGrp LOS	E		F	D		D	F	A	A	D	A	A
Approach Vol, veh/h		6			94			1511			1018	
Approach Delay, s/veh		80.8			42.1			5.9			6.3	
Approach LOS		F			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	65.3	8.8	5.1	4.7	67.5	5.1	8.9
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	60.0	60.0	30.0	40.0	30.0	90.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	3.5	12.6	4.1	2.1	2.1	11.4	2.2	2.6
Green Ext Time (p_c), s	0.1	35.6	0.2	0.0	0.0	50.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	74	26	1182	873	67
Future Volume (veh/h)	119	74	26	1182	873	67
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1865	1900
Adj Flow Rate, veh/h	125	78	27	1244	919	71
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2
Cap, veh/h	288	132	52	2756	3320	256
Arrive On Green	0.08	0.08	0.03	0.78	0.69	0.69
Sat Flow, veh/h	3510	1615	1810	3632	4991	372
Grp Volume(v), veh/h	125	78	27	1244	646	344
Grp Sat Flow(s),veh/h/ln	1755	1615	1810	1770	1697	1799
Q Serve(g_s), s	2.5	3.4	1.1	8.8	5.4	5.4
Cycle Q Clear(g_c), s	2.5	3.4	1.1	8.8	5.4	5.4
Prop In Lane	1.00	1.00	1.00			0.21
Lane Grp Cap(c), veh/h	288	132	52	2756	2337	1239
V/C Ratio(X)	0.43	0.59	0.52	0.45	0.28	0.28
Avail Cap(c_a), veh/h	1919	883	989	5053	2783	1475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	32.4	35.0	2.8	4.4	4.4
Incr Delay (d2), s/veh	1.0	4.1	7.7	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.7	0.7	4.2	2.5	2.7
LnGrp Delay(d),s/veh	33.0	36.5	42.7	2.9	4.5	4.5
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	203			1271	990	
Approach Delay, s/veh	34.4			3.7	4.5	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.5	6.6	56.1				62.7
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		40.0	40.0	60.0				104.5
Max Q Clear Time (g_c+I1), s		5.4	3.1	7.4				10.8
Green Ext Time (p_c), s		0.7	0.0	34.0				46.2

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	301	343	51	221	130	307	902	43	143	658	161
Future Volume (veh/h)	224	301	343	51	221	130	307	902	43	143	658	161
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1845	1900	1900	1810	1900	1863	1863	1900	1863	1863	1845
Adj Flow Rate, veh/h	241	324	369	55	238	140	330	970	46	154	708	173
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	0	0	5	5	2	2	2	2	2	3
Cap, veh/h	276	1297	593	73	538	304	460	1087	52	187	1463	441
Arrive On Green	0.15	0.37	0.37	0.04	0.26	0.26	0.13	0.32	0.32	0.11	0.29	0.29
Sat Flow, veh/h	1792	3505	1602	1810	2100	1185	3442	3439	163	1774	5085	1534
Grp Volume(v), veh/h	241	324	369	55	193	185	330	499	517	154	708	173
Grp Sat Flow(s),veh/h/ln	1792	1752	1602	1810	1719	1566	1721	1770	1832	1774	1695	1534
Q Serve(g_s), s	14.8	7.2	21.3	3.4	10.6	11.3	10.4	30.3	30.3	9.6	13.0	10.2
Cycle Q Clear(g_c), s	14.8	7.2	21.3	3.4	10.6	11.3	10.4	30.3	30.3	9.6	13.0	10.2
Prop In Lane	1.00		1.00	1.00		0.76	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	276	1297	593	73	441	401	460	559	579	187	1463	441
V/C Ratio(X)	0.87	0.25	0.62	0.76	0.44	0.46	0.72	0.89	0.89	0.83	0.48	0.39
Avail Cap(c_a), veh/h	476	1553	710	721	762	694	1220	559	579	472	2028	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.7	24.7	29.1	53.6	35.2	35.4	46.8	36.8	36.8	49.5	33.3	32.3
Incr Delay (d2), s/veh	8.8	0.4	3.9	14.5	1.0	1.2	4.4	18.4	17.9	8.9	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	3.6	10.0	2.0	5.2	5.0	5.2	17.7	18.2	5.2	6.1	4.4
LnGrp Delay(d),s/veh	55.4	25.0	33.0	68.2	36.1	36.6	51.3	55.2	54.7	58.3	33.6	33.1
LnGrp LOS	E	C	C	E	D	D	D	E	D	E	C	C
Approach Vol, veh/h		934			433			1346			1035	
Approach Delay, s/veh		36.0			40.4			54.0			37.2	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.9	40.7	8.5	47.8	19.1	37.5	21.4	34.9
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	30.0	45.0	50.0	40.0	45.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	11.6	32.3	5.4	23.3	12.4	15.0	16.8	13.3
Green Ext Time (p_c), s	0.4	0.0	0.1	13.4	2.7	17.5	0.6	15.7

Intersection Summary	
HCM 2010 Ctrl Delay	43.3
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	34	119	69	34	32	45	553	64	20	445	12
Future Volume (veh/h)	50	34	119	69	34	32	45	553	64	20	445	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1733	1845	1900	1743	1792	1681	1847	1900	1900	1827	1624
Adj Flow Rate, veh/h	55	37	131	76	37	35	49	608	70	22	489	13
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	12	12	3	9	9	6	13	3	3	0	4	17
Cap, veh/h	67	27	545	70	20	530	64	757	87	43	820	606
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.47	0.47	0.02	0.45	0.45
Sat Flow, veh/h	0	78	1566	0	57	1521	1601	1626	187	1810	1827	1350
Grp Volume(v), veh/h	92	0	131	113	0	35	49	0	678	22	489	13
Grp Sat Flow(s),veh/h/ln	78	0	1566	57	0	1521	1601	0	1813	1810	1827	1350
Q Serve(g_s), s	0.0	0.0	5.1	0.0	0.0	1.3	2.6	0.0	27.5	1.0	17.3	0.5
Cycle Q Clear(g_c), s	30.0	0.0	5.1	30.0	0.0	1.3	2.6	0.0	27.5	1.0	17.3	0.5
Prop In Lane	0.60		1.00	0.67		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	94	0	545	90	0	530	64	0	844	43	820	606
V/C Ratio(X)	0.98	0.00	0.24	1.26	0.00	0.07	0.76	0.00	0.80	0.51	0.60	0.02
Avail Cap(c_a), veh/h	94	0	545	90	0	530	558	0	844	630	1061	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	0.0	20.0	36.6	0.0	18.7	40.9	0.0	19.7	41.5	17.9	13.2
Incr Delay (d2), s/veh	86.2	0.0	0.3	180.5	0.0	0.1	19.3	0.0	6.8	10.6	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	2.3	6.6	0.0	0.6	1.5	0.0	15.3	0.6	9.1	0.2
LnGrp Delay(d),s/veh	120.6	0.0	20.2	217.0	0.0	18.8	60.2	0.0	26.5	52.1	19.8	13.2
LnGrp LOS	F		C	F		B	E		C	D	B	B
Approach Vol, veh/h		223			148			727			524	
Approach Delay, s/veh		61.6			170.1			28.8			21.0	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	45.5		34.5	7.6	44.1		34.5
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	30.0	40.0		30.0	30.0	50.0		30.0
Max Q Clear Time (g_c+I1), s	3.0	29.5		32.0	4.6	19.3		32.0
Green Ext Time (p_c), s	0.0	8.3		0.0	0.1	19.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	85	22	645	120	208	43	593	514	99	601	22
Future Volume (veh/h)	25	85	22	645	120	208	43	593	514	99	601	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1841	1900	1881	1870	1900	1900	1845	1881	1900	1861	1900
Adj Flow Rate, veh/h	27	90	23	777	0	221	46	631	547	105	639	23
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	1	3	0	0	3	1	0	2	2
Cap, veh/h	120	191	47	922	0	413	60	1553	708	133	1682	61
Arrive On Green	0.07	0.07	0.07	0.26	0.00	0.26	0.03	0.44	0.44	0.07	0.48	0.48
Sat Flow, veh/h	1740	2771	682	3583	0	1606	1810	3505	1597	1810	3478	125
Grp Volume(v), veh/h	27	56	57	777	0	221	46	631	547	105	325	337
Grp Sat Flow(s),veh/h/ln	1740	1749	1703	1792	0	1606	1810	1752	1597	1810	1768	1835
Q Serve(g_s), s	1.7	3.6	3.8	24.3	0.0	14.0	3.0	14.4	34.2	6.7	13.7	13.7
Cycle Q Clear(g_c), s	1.7	3.6	3.8	24.3	0.0	14.0	3.0	14.4	34.2	6.7	13.7	13.7
Prop In Lane	1.00		0.40	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	120	120	117	922	0	413	60	1553	708	133	855	888
V/C Ratio(X)	0.23	0.46	0.49	0.84	0.00	0.53	0.76	0.41	0.77	0.79	0.38	0.38
Avail Cap(c_a), veh/h	413	415	404	1822	0	816	307	1782	812	537	1124	1167
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	52.8	52.9	41.5	0.0	37.7	56.6	22.3	27.8	53.7	19.3	19.3
Incr Delay (d2), s/veh	0.9	2.7	3.1	2.2	0.0	1.1	18.0	0.2	4.5	9.8	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.8	1.9	12.3	0.0	6.3	1.8	7.0	15.9	3.7	6.8	7.0
LnGrp Delay(d),s/veh	52.9	55.6	56.1	43.7	0.0	38.8	74.6	22.5	32.4	63.5	19.7	19.6
LnGrp LOS	D	E	E	D		D	E	C	C	E	B	B
Approach Vol, veh/h		140			998			1224			767	
Approach Delay, s/veh		55.3			42.6			28.9			25.7	
Approach LOS		E			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.7	57.3		13.1	7.9	62.1		34.9
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	35.0	60.0		28.0	20.0	75.0		60.0
Max Q Clear Time (g_c+I1), s	8.7	36.2		5.8	5.0	15.7		26.3
Green Ext Time (p_c), s	0.3	16.1		0.6	0.1	26.9		4.1

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	654	14	36	852	417	49	19	11	470	19	217
Future Volume (veh/h)	174	654	14	36	852	417	49	19	11	470	19	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1845	1881	1776	1900	1900	1900	1863	1866	1900
Adj Flow Rate, veh/h	181	681	15	38	888	0	51	20	11	504	0	226
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	3	1	7	0	0	0	2	0	0
Cap, veh/h	205	1361	30	49	1054	445	475	302	166	648	0	293
Arrive On Green	0.11	0.38	0.38	0.03	0.29	0.00	0.26	0.26	0.26	0.18	0.00	0.18
Sat Flow, veh/h	1810	3576	79	1757	3574	1509	1810	1151	633	3548	0	1604
Grp Volume(v), veh/h	181	340	356	38	888	0	51	0	31	504	0	226
Grp Sat Flow(s),veh/h/ln	1810	1788	1867	1757	1787	1509	1810	0	1785	1774	0	1604
Q Serve(g_s), s	13.1	19.4	19.4	2.9	31.1	0.0	2.9	0.0	1.7	18.0	0.0	17.9
Cycle Q Clear(g_c), s	13.1	19.4	19.4	2.9	31.1	0.0	2.9	0.0	1.7	18.0	0.0	17.9
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	205	680	711	49	1054	445	475	0	469	648	0	293
V/C Ratio(X)	0.88	0.50	0.50	0.78	0.84	0.00	0.11	0.00	0.07	0.78	0.00	0.77
Avail Cap(c_a), veh/h	210	680	711	270	1207	510	475	0	469	932	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.2	31.6	31.6	64.4	44.1	0.0	37.3	0.0	36.9	51.9	0.0	51.8
Incr Delay (d2), s/veh	31.8	2.1	2.0	22.6	7.3	0.0	0.5	0.0	0.3	3.4	0.0	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	9.9	10.4	1.7	16.4	0.0	1.5	0.0	0.9	9.1	0.0	8.5
LnGrp Delay(d),s/veh	90.0	33.6	33.6	87.0	51.4	0.0	37.8	0.0	37.2	55.3	0.0	58.8
LnGrp LOS	F	C	C	F	D		D		D	E		E
Approach Vol, veh/h		877			926			82			730	
Approach Delay, s/veh		45.2			52.9			37.5			56.4	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.0	8.2	55.7		29.4	19.6	44.3
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		35.0	20.5	45.0		35.0	15.5	45.0
Max Q Clear Time (g_c+I1), s		4.9	4.9	21.4		20.0	15.1	33.1
Green Ext Time (p_c), s		0.3	0.0	19.9		3.7	0.0	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	50.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	683	472	541	1070	0	0	0	0	43	3	296
Future Volume (veh/h)	0	683	472	541	1070	0	0	0	0	43	3	296
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1863	1863	1827	0				1900	1863	1900
Adj Flow Rate, veh/h	0	719	497	569	1126	0				45	3	312
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	2	4	0				0	0	0
Cap, veh/h	0	1008	445	597	2356	0				403	3	349
Arrive On Green	0.00	0.28	0.28	0.34	0.68	0.00				0.22	0.22	0.22
Sat Flow, veh/h	0	3668	1578	1774	3563	0				1810	15	1571
Grp Volume(v), veh/h	0	719	497	569	1126	0				45	0	315
Grp Sat Flow(s),veh/h/ln	0	1787	1578	1774	1736	0				1810	0	1586
Q Serve(g_s), s	0.0	16.8	26.2	29.1	14.4	0.0				1.8	0.0	17.9
Cycle Q Clear(g_c), s	0.0	16.8	26.2	29.1	14.4	0.0				1.8	0.0	17.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1008	445	597	2356	0				403	0	353
V/C Ratio(X)	0.00	0.71	1.12	0.95	0.48	0.00				0.11	0.00	0.89
Avail Cap(c_a), veh/h	0	1008	445	610	2356	0				506	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.77	0.77	0.38	0.38	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.0	33.4	30.2	7.1	0.0				28.8	0.0	35.1
Incr Delay (d2), s/veh	0.0	3.3	73.7	12.8	0.3	0.0				0.0	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.8	20.5	16.3	6.8	0.0				0.9	0.0	9.4
LnGrp Delay(d),s/veh	0.0	33.3	107.1	43.0	7.4	0.0				28.9	0.0	50.2
LnGrp LOS		C	F	D	A					C		D
Approach Vol, veh/h		1216			1695						360	
Approach Delay, s/veh		63.5			19.3						47.5	
Approach LOS		E			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	36.9	31.3		24.8		68.2		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	32.0	20.4		26.0		58.0		
Max Q Clear Time (g_c+I1), s	31.1	28.2		19.9		16.4		
Green Ext Time (p_c), s	0.1	0.0		0.8		15.1		

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	524	0	0	1104	99	507	4	517	0	0	0
Future Volume (veh/h)	202	524	0	0	1104	99	507	4	517	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1900	1810	1839	1863			
Adj Flow Rate, veh/h	220	570	0	0	1200	108	729	0	374			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	1	0	0	1	1	5	0	2			
Cap, veh/h	253	2202	0	0	1449	130	1007	0	463			
Arrive On Green	0.14	0.62	0.00	0.00	0.44	0.44	0.29	0.00	0.29			
Sat Flow, veh/h	1774	3668	0	0	3412	298	3447	0	1583			
Grp Volume(v), veh/h	220	570	0	0	645	663	729	0	374			
Grp Sat Flow(s),veh/h/ln	1774	1787	0	0	1787	1829	1723	0	1583			
Q Serve(g_s), s	11.5	6.9	0.0	0.0	30.2	30.4	18.0	0.0	20.8			
Cycle Q Clear(g_c), s	11.5	6.9	0.0	0.0	30.2	30.4	18.0	0.0	20.8			
Prop In Lane	1.00		0.00	0.00		0.16	1.00		1.00			
Lane Grp Cap(c), veh/h	253	2202	0	0	781	799	1007	0	463			
V/C Ratio(X)	0.87	0.26	0.00	0.00	0.83	0.83	0.72	0.00	0.81			
Avail Cap(c_a), veh/h	280	2202	0	0	781	799	1234	0	567			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.71	0.71	0.00	0.00	0.84	0.84	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.9	8.3	0.0	0.0	23.6	23.6	30.2	0.0	31.1			
Incr Delay (d2), s/veh	16.0	0.2	0.0	0.0	8.3	8.3	2.0	0.0	7.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.7	3.5	0.0	0.0	16.7	17.1	8.9	0.0	10.1			
LnGrp Delay(d),s/veh	55.9	8.5	0.0	0.0	31.9	31.9	32.2	0.0	39.1			
LnGrp LOS	E	A			C	C	C		D			
Approach Vol, veh/h		790			1308			1103				
Approach Delay, s/veh		21.7			31.9			34.5				
Approach LOS		C			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.1			17.0	46.1		31.9
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		52.0			15.0	33.5		34.0
Max Q Clear Time (g_c+I1), s		8.9			13.5	32.4		22.8
Green Ext Time (p_c), s		12.1			0.1	0.9		5.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	913	116	20	1117	0	86	0	19	0	0	0
Future Volume (veh/h)	52	913	116	20	1117	0	86	0	19	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1861	1900	1900	1863	0	1827	0	1810			
Adj Flow Rate, veh/h	57	1003	127	22	1227	0	95	0	21			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	0	4	0	5			
Cap, veh/h	104	2242	284	36	2388	0	133	0	118			
Arrive On Green	0.06	0.71	0.71	0.02	0.67	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3148	398	1810	3632	0	1740	0	1538			
Grp Volume(v), veh/h	57	563	567	22	1227	0	95	0	21			
Grp Sat Flow(s),veh/h/ln	1810	1768	1779	1810	1770	0	1740	0	1538			
Q Serve(g_s), s	2.2	9.5	9.5	0.9	12.2	0.0	3.8	0.0	0.9			
Cycle Q Clear(g_c), s	2.2	9.5	9.5	0.9	12.2	0.0	3.8	0.0	0.9			
Prop In Lane	1.00		0.22	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	104	1259	1267	36	2388	0	133	0	118			
V/C Ratio(X)	0.55	0.45	0.45	0.61	0.51	0.00	0.71	0.00	0.18			
Avail Cap(c_a), veh/h	641	1259	1267	641	2509	0	617	0	545			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.4	4.3	4.3	34.3	5.7	0.0	31.8	0.0	30.5			
Incr Delay (d2), s/veh	4.5	0.7	0.7	15.7	0.5	0.0	6.9	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	4.8	4.8	0.6	6.0	0.0	2.0	0.0	0.4			
LnGrp Delay(d),s/veh	36.9	5.0	5.0	50.0	6.2	0.0	38.7	0.0	31.2			
LnGrp LOS	D	A	A	D	A		D		C			
Approach Vol, veh/h		1187			1249			116				
Approach Delay, s/veh		6.5			7.0			37.3				
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	5.4	55.2			8.0	52.6		9.9
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	25.0	50.0			25.0	50.0		25.0
Max Q Clear Time (g_c+I1), s	2.9	11.5			4.2	14.2		5.8
Green Ext Time (p_c), s	0.0	36.0			0.1	33.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1035	999	2
Future Vol, veh/h	0	20	5	1035	999	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1067	1030	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	516	1032	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	496	681	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	496	681	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	681	-	496	-	-
HCM Lane V/C Ratio	0.008	-	0.042	-	-
HCM Control Delay (s)	10.3	-	12.6	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	52	51	340	253	49
Future Vol, veh/h	65	52	51	340	253	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	57	55	370	275	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	598	164	328	0	-	0
Stage 1	302	-	-	-	-	-
Stage 2	296	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	434	852	1228	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	415	852	1228	-	-	-
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1228	-	415	852	-	-
HCM Lane V/C Ratio	0.045	-	0.17	0.066	-	-
HCM Control Delay (s)	8.1	-	15.4	9.5	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	597	132	18	604	39	116	3	23	68	10	349
Future Volume (veh/h)	179	597	132	18	604	39	116	3	23	68	10	349
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	195	649	143	20	657	42	126	3	25	74	11	379
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	1072	236	139	1108	71	166	16	135	410	61	418
Arrive On Green	0.13	0.37	0.37	0.08	0.33	0.33	0.09	0.09	0.09	0.26	0.26	0.26
Sat Flow, veh/h	1774	2885	635	1774	3378	216	1774	172	1437	1554	231	1583
Grp Volume(v), veh/h	195	398	394	20	344	355	126	0	28	85	0	379
Grp Sat Flow(s),veh/h/ln	1774	1770	1751	1774	1770	1825	1774	0	1609	1785	0	1583
Q Serve(g_s), s	10.0	17.1	17.1	1.0	15.2	15.2	6.5	0.0	1.5	3.4	0.0	21.7
Cycle Q Clear(g_c), s	10.0	17.1	17.1	1.0	15.2	15.2	6.5	0.0	1.5	3.4	0.0	21.7
Prop In Lane	1.00		0.36	1.00		0.12	1.00		0.89	0.87		1.00
Lane Grp Cap(c), veh/h	236	657	650	139	580	598	166	0	151	471	0	418
V/C Ratio(X)	0.83	0.60	0.61	0.14	0.59	0.59	0.76	0.00	0.19	0.18	0.00	0.91
Avail Cap(c_a), veh/h	568	1133	1121	568	1133	1168	568	0	515	572	0	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.6	23.9	23.9	40.2	26.3	26.3	41.4	0.0	39.2	26.6	0.0	33.4
Incr Delay (d2), s/veh	7.2	3.2	3.3	0.5	3.5	3.4	6.9	0.0	0.6	0.2	0.0	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	8.9	8.8	0.5	7.9	8.2	3.5	0.0	0.7	1.7	0.0	11.5
LnGrp Delay(d),s/veh	46.8	27.1	27.2	40.7	29.7	29.7	48.3	0.0	39.7	26.8	0.0	51.1
LnGrp LOS	D	C	C	D	C	C	D		D	C		D
Approach Vol, veh/h		987			719			154			464	
Approach Delay, s/veh		31.0			30.0			46.7			46.6	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.4	39.8		12.8	16.4	35.7		28.7
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	30.0	* 60		30.0	30.0	60.0		30.0
Max Q Clear Time (g_c+I1), s	3.0	19.1		8.5	12.0	17.2		23.7
Green Ext Time (p_c), s	11.1	15.7		0.5	0.5	13.5		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.9
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	43.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	291	244	77	251	0	490	0	129	0	0	0
Future Vol, veh/h	1	291	244	77	251	0	490	0	129	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	7	3	7	6	0	5	0	4	0	0	0
Mvmt Flow	1	303	254	80	261	0	510	0	134	0	0	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	19	18.5	77.1	0
HCM LOS	C	C	F	-

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	490	129	292	244	77	251	0
LT Vol	490	0	1	0	77	0	0
Through Vol	0	0	291	0	0	251	0
RT Vol	0	129	0	244	0	0	0
Lane Flow Rate	510	134	304	254	80	261	0
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	1.087	0.237	0.614	0.472	0.181	0.553	0
Departure Headway (Hd)	7.667	6.359	7.605	7.003	8.511	7.976	9.045
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	475	564	478	519	424	455	0
Service Time	5.412	4.104	5.305	4.703	6.211	5.676	7.045
HCM Lane V/C Ratio	1.074	0.238	0.636	0.489	0.189	0.574	0
HCM Control Delay	94.5	11.1	21.7	15.8	13.1	20.1	12
HCM Lane LOS	F	B	C	C	B	C	N
HCM 95th-tile Q	16.6	0.9	4.1	2.5	0.7	3.3	0

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	67	819	5	98	417
Future Vol, veh/h	3	67	819	5	98	417
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	2	0	2	5
Mvmt Flow	3	72	881	5	105	448

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1542	883	0	0	886	0
Stage 1	883	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	128	348	-	-	764	-
Stage 1	408	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	110	348	-	-	764	-
Mov Cap-2 Maneuver	110	-	-	-	-	-
Stage 1	408	-	-	-	-	-
Stage 2	447	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.8	0	2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	318	764	-
HCM Lane V/C Ratio	-	-	0.237	0.138	-
HCM Control Delay (s)	-	-	19.8	10.5	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.9	0.5	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	3	31	1	5	9	815	69	2	420	1
Future Vol, veh/h	2	2	3	31	1	5	9	815	69	2	420	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	1	0	5	0
Mvmt Flow	2	2	3	34	1	5	10	886	75	2	457	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1367	1366	457	1368	1367	886	458	0	0	886	0	0
Stage 1	461	461	-	905	905	-	-	-	-	-	-	-
Stage 2	906	905	-	463	462	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	125	149	608	125	148	346	1114	-	-	773	-	-
Stage 1	584	569	-	334	358	-	-	-	-	-	-	-
Stage 2	333	358	-	583	568	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	121	147	608	122	146	346	1114	-	-	773	-	-
Mov Cap-2 Maneuver	121	147	-	122	146	-	-	-	-	-	-	-
Stage 1	579	568	-	331	355	-	-	-	-	-	-	-
Stage 2	324	355	-	576	567	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.6	41.4	0.1	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	133	608	123	346	773	-	-
HCM Lane V/C Ratio	0.009	-	-	0.033	0.005	0.283	0.016	0.003	-	-
HCM Control Delay (s)	8.3	-	-	33	11	45.4	15.6	9.7	-	-
HCM Lane LOS	A	-	-	D	B	E	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	1.1	0	0	-	-

Intersection	
Intersection Delay, s/veh	13.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	28	89	51	21	11	99	208	80	7	125	79
Future Vol, veh/h	87	28	89	51	21	11	99	208	80	7	125	79
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	5	0	5	0	5	0	4	2	1	0	5	4
Mvmt Flow	98	31	100	57	24	12	111	234	90	8	140	89
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	11.7	12.1	15.2	11.3
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	76%	0%	61%	100%	0%	0%
Vol Thru, %	0%	72%	24%	0%	25%	0%	100%	0%
Vol Right, %	0%	28%	0%	100%	13%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	288	115	89	83	7	125	79
LT Vol	99	0	87	0	51	7	0	0
Through Vol	0	208	28	0	21	0	125	0
RT Vol	0	80	0	89	11	0	0	79
Lane Flow Rate	111	324	129	100	93	8	140	89
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.214	0.555	0.264	0.172	0.196	0.016	0.268	0.151
Departure Headway (Hd)	6.914	6.174	7.355	6.179	7.554	7.291	6.869	6.14
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	516	579	486	576	478	488	520	579
Service Time	4.694	3.953	5.147	3.97	5.254	5.086	4.664	3.934
HCM Lane V/C Ratio	0.215	0.56	0.265	0.174	0.195	0.016	0.269	0.154
HCM Control Delay	11.6	16.5	12.8	10.3	12.1	10.2	12.2	10
HCM Lane LOS	B	C	B	B	B	B	B	A
HCM 95th-tile Q	0.8	3.4	1.1	0.6	0.7	0	1.1	0.5

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	28	405	272	1
Future Vol, veh/h	0	11	28	405	272	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	2	3	0
Mvmt Flow	0	13	33	471	316	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	853	317	317	0	-	0
Stage 1	317	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	332	728	1232	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	323	728	1232	-	-	-
Mov Cap-2 Maneuver	323	-	-	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	575	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1232	-	728	-	-
HCM Lane V/C Ratio	0.026	-	0.018	-	-
HCM Control Delay (s)	8	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	193	240	30	133	150
Future Vol, veh/h	41	193	240	30	133	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	10	2	1	7	5	1
Mvmt Flow	47	219	273	34	151	170

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	763	290	0	0	307	0
Stage 1	290	-	-	-	-	-
Stage 2	473	-	-	-	-	-
Critical Hdwy	6.5	6.22	-	-	4.15	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	-	-	2.245	-
Pot Cap-1 Maneuver	361	749	-	-	1237	-
Stage 1	741	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	317	749	-	-	1237	-
Mov Cap-2 Maneuver	317	-	-	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	536	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	3.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	605	1237	-
HCM Lane V/C Ratio	-	-	0.44	0.122	-
HCM Control Delay (s)	-	-	15.5	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.4	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	9	279	7	5	190
Future Vol, veh/h	40	9	279	7	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	43	10	297	7	5	202

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	514	301	0	0	304	0
Stage 1	301	-	-	-	-	-
Stage 2	213	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	524	743	-	-	1268	-
Stage 1	755	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	522	743	-	-	1268	-
Mov Cap-2 Maneuver	522	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	824	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	522	743	1268	-
HCM Lane V/C Ratio	-	-	0.082	0.013	0.004	-
HCM Control Delay (s)	-	-	12.5	9.9	7.9	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	8	0	278	44	8	222	0
Future Vol, veh/h	0	0	0	38	0	8	0	278	44	8	222	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	3	0	0	0	2	0	0	3	0
Mvmt Flow	0	0	0	42	0	9	0	305	48	9	244	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	596	616	244	592	592	330	244	0	0	354	0	0
Stage 1	262	262	-	330	330	-	-	-	-	-	-	-
Stage 2	334	354	-	262	262	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	418	409	800	416	422	716	1334	-	-	1216	-	-
Stage 1	747	695	-	681	649	-	-	-	-	-	-	-
Stage 2	684	634	-	741	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	411	406	800	414	419	716	1334	-	-	1216	-	-
Mov Cap-2 Maneuver	411	406	-	414	419	-	-	-	-	-	-	-
Stage 1	747	690	-	681	649	-	-	-	-	-	-	-
Stage 2	676	634	-	736	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.1	0	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1334	-	-	-	447	1216	-	-
HCM Lane V/C Ratio	-	-	-	-	0.113	0.007	-	-
HCM Control Delay (s)	0	-	-	0	14.1	8	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	42	280	160	38	222
Future Vol, veh/h	159	42	280	160	38	222
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	181	48	318	182	43	252

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	748	409	0	0	500	0
Stage 1	409	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	383	647	-	-	1075	-
Stage 1	675	-	-	-	-	-
Stage 2	726	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	368	647	-	-	1075	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	697	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	481	647	1075	-
HCM Lane V/C Ratio	-	-	0.376	0.074	0.04	-
HCM Control Delay (s)	-	-	16.9	11	8.5	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.7	0.2	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	23	410	362	3
Future Vol, veh/h	3	29	23	410	362	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	3	4	2	3	0
Mvmt Flow	3	33	26	461	407	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	920	408	410	0	-	0
Stage 1	408	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	303	641	1138	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	296	641	1138	-	-	-
Mov Cap-2 Maneuver	422	-	-	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1138	-	611	-	-
HCM Lane V/C Ratio	0.023	-	0.059	-	-
HCM Control Delay (s)	8.2	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	115	1	1	15	200	710	5	3	718	12
Future Vol, veh/h	0	0	115	1	1	15	200	710	5	3	718	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	7	4	3	0	33	1	0
Mvmt Flow	0	0	121	1	1	16	211	747	5	3	756	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	756	1933	1933	750	756	0	0	753	0	0
Stage 1	-	-	-	1171	1171	-	-	-	-	-	-	-
Stage 2	-	-	-	762	762	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.21	7.1	6.5	6.27	4.14	-	-	4.43	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.309	3.5	4	3.363	2.236	-	-	2.497	-	-
Pot Cap-1 Maneuver	0	0	410	50	67	403	846	-	-	733	-	-
Stage 1	0	0	-	237	269	-	-	-	-	-	-	-
Stage 2	0	0	-	400	416	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	410	28	50	403	846	-	-	733	-	-
Mov Cap-2 Maneuver	-	-	-	28	50	-	-	-	-	-	-	-
Stage 1	-	-	-	178	202	-	-	-	-	-	-	-
Stage 2	-	-	-	281	414	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.4	26.8	2.3	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	846	-	-	410	183	733	-	-
HCM Lane V/C Ratio	0.249	-	-	0.295	0.098	0.004	-	-
HCM Control Delay (s)	10.7	-	-	17.4	26.8	9.9	-	-
HCM Lane LOS	B	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	1	-	-	1.2	0.3	0	-	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	44	176	148	66	22	178	206	115	22	213	36
Future Volume (veh/h)	50	44	176	148	66	22	178	206	115	22	213	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1667	1827	1881	1810	1900	1863	1863	1845	1900	1852	1900
Adj Flow Rate, veh/h	62	54	217	183	81	27	220	254	142	27	263	44
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	14	4	1	5	5	2	2	3	0	2	2
Cap, veh/h	331	330	300	288	208	69	281	600	496	33	520	86
Arrive On Green	0.20	0.20	0.20	0.16	0.16	0.16	0.16	0.32	0.32	0.02	0.17	0.17
Sat Flow, veh/h	1675	1667	1514	1792	1294	431	1774	1863	1541	1810	3000	493
Grp Volume(v), veh/h	62	54	217	183	0	108	220	254	142	27	152	155
Grp Sat Flow(s),veh/h/ln	1675	1667	1514	1792	0	1726	1774	1863	1541	1810	1760	1733
Q Serve(g_s), s	1.8	1.6	7.8	5.6	0.0	3.3	6.9	6.2	4.0	0.9	4.6	4.7
Cycle Q Clear(g_c), s	1.8	1.6	7.8	5.6	0.0	3.3	6.9	6.2	4.0	0.9	4.6	4.7
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	331	330	300	288	0	277	281	600	496	33	305	301
V/C Ratio(X)	0.19	0.16	0.72	0.64	0.00	0.39	0.78	0.42	0.29	0.82	0.50	0.51
Avail Cap(c_a), veh/h	807	803	729	863	0	831	763	1282	1060	794	1211	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	19.3	21.8	22.8	0.0	21.8	23.5	15.5	14.7	28.4	21.7	21.8
Incr Delay (d2), s/veh	0.1	0.1	1.3	0.9	0.0	0.3	4.8	0.2	0.1	16.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.7	3.3	2.8	0.0	1.6	3.7	3.2	1.7	0.6	2.2	2.3
LnGrp Delay(d),s/veh	19.5	19.4	23.1	23.7	0.0	22.2	28.3	15.6	14.8	44.8	22.2	22.3
LnGrp LOS	B	B	C	C		C	C	B	B	D	C	C
Approach Vol, veh/h		333			291			616			334	
Approach Delay, s/veh		21.8			23.1			20.0			24.1	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	24.2		15.5	13.7	15.6		13.3
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	25.5	40.0		28.0	25.0	40.0		28.0
Max Q Clear Time (g_c+I1), s	2.9	8.2		9.8	8.9	6.7		7.6
Green Ext Time (p_c), s	0.0	2.5		0.6	0.5	2.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	14	9	78	24	260	15	279	86	313	350	8
Future Volume (veh/h)	9	14	9	78	24	260	15	279	86	313	350	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1845	1900	1881	1845	1863	1846	1900
Adj Flow Rate, veh/h	10	16	10	89	27	295	17	317	98	356	398	9
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	3	0	1	3	2	3	3
Cap, veh/h	147	192	93	355	91	694	23	564	464	426	947	21
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.01	0.30	0.30	0.24	0.53	0.53
Sat Flow, veh/h	238	942	454	1076	447	1560	1810	1881	1547	1774	1797	41
Grp Volume(v), veh/h	36	0	0	116	0	295	17	317	98	356	0	407
Grp Sat Flow(s),veh/h/ln	1633	0	0	1523	0	1560	1810	1881	1547	1774	0	1837
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	6.1	0.4	6.6	2.2	8.9	0.0	6.3
Cycle Q Clear(g_c), s	0.8	0.0	0.0	2.9	0.0	6.1	0.4	6.6	2.2	8.9	0.0	6.3
Prop In Lane	0.28		0.28	0.77		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	431	0	0	447	0	694	23	564	464	426	0	968
V/C Ratio(X)	0.08	0.00	0.00	0.26	0.00	0.42	0.74	0.56	0.21	0.84	0.00	0.42
Avail Cap(c_a), veh/h	767	0	0	732	0	993	618	1447	1190	606	0	1413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.1	0.0	0.0	15.9	0.0	8.9	23.0	13.8	12.3	16.9	0.0	6.7
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.4	15.7	0.9	0.2	6.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.3	0.0	2.6	0.3	3.6	1.0	5.1	0.0	3.2
LnGrp Delay(d),s/veh	15.2	0.0	0.0	16.2	0.0	9.3	38.7	14.7	12.5	23.0	0.0	7.0
LnGrp LOS	B			B		A	D	B	B	C		A
Approach Vol, veh/h		36			411			432			763	
Approach Delay, s/veh		15.2			11.3			15.1			14.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.2	18.0		13.6	4.6	28.7		13.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	36.0		20.0	16.0	36.0		18.5
Max Q Clear Time (g_c+I1), s	10.9	8.6		2.8	2.4	8.3		8.1
Green Ext Time (p_c), s	0.4	5.3		1.8	0.0	5.3		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Future Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1843	1810	1845	1859	1900	1881	1870	1900	1845	1827	1881
Adj Flow Rate, veh/h	60	52	65	72	58	48	154	364	94	34	151	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	5	3	4	4	1	2	2	3	4	1
Cap, veh/h	132	114	211	242	130	107	201	820	209	70	402	352
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.29	0.29	0.04	0.22	0.00
Sat Flow, veh/h	962	834	1538	1757	942	780	1792	2805	716	1757	1827	1599
Grp Volume(v), veh/h	112	0	65	72	0	106	154	229	229	34	151	0
Grp Sat Flow(s),veh/h/ln	1795	0	1538	1757	0	1722	1792	1777	1744	1757	1827	1599
Q Serve(g_s), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Cycle Q Clear(g_c), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Prop In Lane	0.54		1.00	1.00		0.45	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	211	242	0	237	201	519	510	70	402	352
V/C Ratio(X)	0.45	0.00	0.31	0.30	0.00	0.45	0.77	0.44	0.45	0.48	0.38	0.00
Avail Cap(c_a), veh/h	1480	0	1268	1207	0	1183	985	1953	1917	965	2008	1758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	14.1	14.1	0.0	14.4	15.7	10.5	10.5	17.1	12.1	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.3	0.3	0.0	0.5	2.3	0.3	0.3	1.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.6	0.7	0.0	1.0	1.6	1.9	1.9	0.4	1.3	0.0
LnGrp Delay(d),s/veh	14.9	0.0	14.4	14.4	0.0	14.9	18.0	10.8	10.8	19.0	12.4	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		177			178			612			185	
Approach Delay, s/veh		14.7			14.7			12.6			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	14.3		8.5	7.1	11.7		9.1
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		25.0
Max Q Clear Time (g_c+I1), s	2.7	5.9		4.1	5.0	4.6		4.1
Green Ext Time (p_c), s	0.0	2.8		0.4	0.1	2.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	13.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	304	241	59	80	176
Future Vol, veh/h	130	304	241	59	80	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	1	2	2	4	5
Mvmt Flow	143	334	265	65	88	193

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	634	265	0	0	265	0
Stage 1	265	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.43	6.21	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	-	-	2.236	-
Pot Cap-1 Maneuver	442	776	-	-	1287	-
Stage 1	777	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	408	776	-	-	1287	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	777	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.7	0	2.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	611	1287	-
HCM Lane V/C Ratio	-	-	0.781	0.068	-
HCM Control Delay (s)	-	-	28.7	8	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	7.4	0.2	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	111	90	30	96	132
Future Vol, veh/h	28	111	90	30	96	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	2	7	5	3
Mvmt Flow	33	129	105	35	112	153

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	162	0	341	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	244	-
Critical Hdwy	-	-	4.12	-	6.45	6.23
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.327
Pot Cap-1 Maneuver	-	-	1417	-	649	956
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1417	-	600	956
Mov Cap-2 Maneuver	-	-	-	-	600	-
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	730	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.8	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	765	-	-	1417	-
HCM Lane V/C Ratio	0.347	-	-	0.074	-
HCM Control Delay (s)	12.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.6	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	195	120	222	168	24	123	311	214	29	337	59
Future Volume (veh/h)	70	195	120	222	168	24	123	311	214	29	337	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	74	207	128	236	179	26	131	331	228	31	359	63
Adj No. of Lanes	1	1	1	2	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	96	374	311	354	457	388	169	730	794	46	608	512
Arrive On Green	0.05	0.20	0.20	0.10	0.25	0.25	0.10	0.40	0.40	0.03	0.33	0.33
Sat Flow, veh/h	1757	1881	1568	3476	1863	1580	1707	1827	1583	1810	1863	1568
Grp Volume(v), veh/h	74	207	128	236	179	26	131	331	228	31	359	63
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1580	1707	1827	1583	1810	1863	1568
Q Serve(g_s), s	3.0	7.2	5.2	4.8	5.9	0.9	5.5	9.7	6.1	1.2	11.7	2.1
Cycle Q Clear(g_c), s	3.0	7.2	5.2	4.8	5.9	0.9	5.5	9.7	6.1	1.2	11.7	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	96	374	311	354	457	388	169	730	794	46	608	512
V/C Ratio(X)	0.77	0.55	0.41	0.67	0.39	0.07	0.78	0.45	0.29	0.67	0.59	0.12
Avail Cap(c_a), veh/h	482	774	645	1191	894	758	585	1002	1030	496	894	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	26.3	25.5	31.6	23.0	21.1	32.1	16.0	10.6	35.2	20.5	17.2
Incr Delay (d2), s/veh	11.9	2.7	1.9	2.2	1.2	0.2	7.4	0.9	0.4	15.4	2.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.0	2.4	2.4	3.1	0.4	2.9	5.1	2.7	0.8	6.3	0.9
LnGrp Delay(d),s/veh	46.0	29.1	27.4	33.7	24.1	21.3	39.5	17.0	11.0	50.7	22.4	17.5
LnGrp LOS	D	C	C	C	C	C	D	B	B	D	C	B
Approach Vol, veh/h		409			441			690			453	
Approach Delay, s/veh		31.6			29.1			19.3			23.7	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	34.7	11.9	20.0	11.7	29.3	8.5	23.4
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	20.0	40.0	25.0	30.0	25.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	3.2	11.7	6.8	9.2	7.5	13.7	5.0	7.9
Green Ext Time (p_c), s	0.0	11.7	0.7	5.3	0.3	10.1	0.1	5.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	113	0	55	0	582	89	76	602	0
Future Volume (vph)	0	0	69	113	0	55	0	582	89	76	602	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.98		1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1602	1802		1455		3444		1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1602	1802		1455		3444		1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	118	0	57	0	606	93	79	627	0
RTOR Reduction (vph)	0	0	60	0	0	47	0	12	0	0	0	0
Lane Group Flow (vph)	0	0	12	118	0	10	0	687	0	79	627	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	
Protected Phases								6		5	2	
Permitted Phases			4	8		8						
Actuated Green, G (s)			8.2	8.2		8.2		22.7		3.5	30.2	
Effective Green, g (s)			8.2	8.2		8.2		22.7		3.5	30.2	
Actuated g/C Ratio			0.17	0.17		0.17		0.47		0.07	0.63	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			274	308		249		1632		128	2231	
v/s Ratio Prot								c0.20		c0.05	0.18	
v/s Ratio Perm			0.01	c0.07		0.01						
v/c Ratio			0.04	0.38		0.04		0.42		0.62	0.28	
Uniform Delay, d1			16.6	17.6		16.6		8.3		21.5	4.0	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			0.1	1.1		0.1		0.2		6.1	0.1	
Delay (s)			16.6	18.7		16.7		8.5		27.6	4.1	
Level of Service			B	B		B		A		C	A	
Approach Delay (s)		16.6			18.0			8.5			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	23	204	118	24	23	198	490	98	64	621	99
Future Volume (veh/h)	117	23	204	118	24	23	198	490	98	64	621	99
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1863	1881	1845	1863	1881
Adj Flow Rate, veh/h	122	24	212	123	25	24	206	510	102	67	647	103
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	1	3	2	1
Cap, veh/h	159	206	315	160	199	182	255	1861	840	87	1518	676
Arrive On Green	0.09	0.11	0.11	0.09	0.11	0.11	0.15	0.53	0.53	0.05	0.43	0.43
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	3539	1597	1757	3539	1577
Grp Volume(v), veh/h	122	24	212	123	25	24	206	510	102	67	647	103
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1770	1597	1757	1770	1577
Q Serve(g_s), s	5.3	0.9	5.6	5.3	1.0	1.0	8.8	6.2	2.5	2.9	9.9	3.1
Cycle Q Clear(g_c), s	5.3	0.9	5.6	5.3	1.0	1.0	8.8	6.2	2.5	2.9	9.9	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	159	206	315	160	199	182	255	1861	840	87	1518	676
V/C Ratio(X)	0.77	0.12	0.67	0.77	0.13	0.13	0.81	0.27	0.12	0.77	0.43	0.15
Avail Cap(c_a), veh/h	677	711	1084	683	684	628	1015	2295	1036	456	2295	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	30.7	32.8	34.2	30.8	30.8	31.8	10.1	9.3	36.2	15.4	13.5
Incr Delay (d2), s/veh	7.6	0.2	2.5	7.5	0.3	0.3	6.0	0.2	0.1	13.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.5	2.3	2.9	0.5	0.5	4.7	3.0	1.1	1.7	4.8	1.4
LnGrp Delay(d),s/veh	41.9	31.0	35.4	41.7	31.1	31.1	37.8	10.3	9.4	49.5	15.8	13.7
LnGrp LOS	D	C	D	D	C	C	D	B	A	D	B	B
Approach Vol, veh/h		358			172			818			817	
Approach Delay, s/veh		37.3			38.7			17.1			18.3	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	45.6	11.0	12.7	15.3	38.1	11.0	12.7
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	4.9	8.2	7.3	7.6	10.8	11.9	7.3	3.0
Green Ext Time (p_c), s	0.1	22.3	0.3	1.1	0.6	21.2	0.3	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	0	290	407	149	169	340	558	245	0	880	82
Future Volume (veh/h)	80	0	290	407	149	169	340	558	245	0	880	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1867	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	83	0	302	424	171	166	354	581	255	0	917	85
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	110	0	0	538	268	217	403	2867	884	0	1357	443
Arrive On Green	0.06	0.00	0.00	0.15	0.14	0.14	0.22	0.56	0.56	0.00	0.27	0.27
Sat Flow, veh/h	1810	83		3548	1867	1509	1810	5085	1568	0	5103	1615
Grp Volume(v), veh/h	83	33.0		424	171	166	354	581	255	0	917	85
Grp Sat Flow(s),veh/h/ln	1810	C		1774	1867	1509	1810	1695	1568	0	1647	1615
Q Serve(g_s), s	2.8			7.3	5.4	6.7	11.9	3.5	5.3	0.0	10.4	2.5
Cycle Q Clear(g_c), s	2.8			7.3	5.4	6.7	11.9	3.5	5.3	0.0	10.4	2.5
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	110			538	268	217	403	2867	884	0	1357	443
V/C Ratio(X)	0.75			0.79	0.64	0.77	0.88	0.20	0.29	0.00	0.68	0.19
Avail Cap(c_a), veh/h	574			3350	1037	838	862	5585	1722	0	2744	897
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	29.1			25.8	25.4	26.0	23.7	6.8	7.2	0.0	20.4	17.5
Incr Delay (d2), s/veh	3.9			1.0	0.9	2.1	2.5	0.0	0.1	0.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5			3.6	2.9	2.9	6.2	1.6	2.3	0.0	4.8	1.1
LnGrp Delay(d),s/veh	33.0			26.7	26.4	28.1	26.1	6.8	7.2	0.0	20.6	17.6
LnGrp LOS	C			C	C	C	C	A	A		C	B
Approach Vol, veh/h					761			1190			1002	
Approach Delay, s/veh					27.0			12.6			20.3	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		41.2	14.0		18.2	23.0	7.9	13.9
Change Period (Y+Rc), s		5.7	4.4		* 4.2	5.7	4.1	4.8
Max Green Setting (Gmax), s		69.2	59.5		* 30	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s		7.3	9.3		13.9	12.4	4.8	8.7
Green Ext Time (p_c), s		5.1	0.3		0.1	4.9	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	373	281	50	107	0	335	0	683	90	432	494	219
Future Volume (veh/h)	373	281	50	107	0	335	0	683	90	432	494	219
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1827	1900	0	1900	0	1776	1900	1881	1845	1827
Adj Flow Rate, veh/h	385	290	52	110	0	345	0	704	93	445	509	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	4	0	0	0	0	7	0	1	3	4
Cap, veh/h	576	470	206	203	0	0	0	1346	356	589	1664	737
Arrive On Green	0.17	0.13	0.13	0.11	0.00	0.00	0.00	0.22	0.22	0.17	0.47	0.00
Sat Flow, veh/h	3442	3539	1553	1810	110		0	6357	1615	3476	3505	1553
Grp Volume(v), veh/h	385	290	52	110	21.1		0	704	93	445	509	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1553	1810	C		0	1527	1615	1738	1752	1553
Q Serve(g_s), s	5.1	3.7	1.4	2.8			0.0	4.9	2.3	5.9	4.3	0.0
Cycle Q Clear(g_c), s	5.1	3.7	1.4	2.8			0.0	4.9	2.3	5.9	4.3	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	576	470	206	203			0	1346	356	589	1664	737
V/C Ratio(X)	0.67	0.62	0.25	0.54			0.00	0.52	0.26	0.76	0.31	0.00
Avail Cap(c_a), veh/h	3572	2571	1128	1503			0	5706	1509	1804	5391	2389
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	19.7	18.7	20.2			0.0	16.5	15.5	19.1	7.8	0.0
Incr Delay (d2), s/veh	1.0	0.5	0.2	0.8			0.0	0.1	0.1	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	1.8	0.6	1.4			0.0	2.1	1.0	2.8	2.1	0.0
LnGrp Delay(d),s/veh	19.8	20.2	19.0	21.1			0.0	16.7	15.7	19.8	7.8	0.0
LnGrp LOS	B	C	B	C				B	B	B	A	
Approach Vol, veh/h		727						797			954	
Approach Delay, s/veh		19.9						16.5			13.4	
Approach LOS		B						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	12.3	16.3	9.1	10.5		28.6	12.2	
Change Period (Y+Rc), s	4.1	5.7	3.7	4.1		5.7	4.1	
Max Green Setting (Gmax), s	25.0	45.0	40.0	35.0		74.1	50.0	
Max Q Clear Time (g_c+I1), s	7.9	6.9	4.8	5.7		6.3	7.1	
Green Ext Time (p_c), s	0.3	3.7	0.0	0.7		3.7	1.1	

Intersection Summary	
HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Notes

HCM Unsignalized Intersection Capacity Analysis
11: Sierra College Blvd & Schriber Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	106	669	72	0	651
Future Volume (Veh/h)	0	106	669	72	0	651
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	110	697	75	0	678
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			443			404
pX, platoon unblocked	0.93	1.00			1.00	
vC, conflicting volume	1074	213			773	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	907	195			757	
tC, single (s)	7.8	7.0			5.4	
tC, 2 stage (s)						
tF (s)	4.0	3.4			2.9	
p0 queue free %	100	86			100	
cM capacity (veh/h)	186	795			530	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	110	199	199	199	175	339	339
Volume Left	0	0	0	0	0	0	0
Volume Right	110	0	0	0	75	0	0
cSH	795	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.14	0.12	0.12	0.12	0.10	0.20	0.20
Queue Length 95th (ft)	12	0	0	0	0	0	0
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.3	0.0				0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	70	1	18	1	720	77	31	614	5
Future Volume (veh/h)	3	0	3	70	1	18	1	720	77	31	614	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1827	1900	1900	1900	1863	1881	1727	1863	1900
Adj Flow Rate, veh/h	3	0	3	72	1	19	1	742	79	32	633	5
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	4	0	0	0	2	1	10	2	0
Cap, veh/h	7	0	7	214	121	103	4	2525	793	59	1880	857
Arrive On Green	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.50	0.50	0.04	0.53	0.53
Sat Flow, veh/h	1810	0	1615	3375	1900	1615	1810	5085	1597	1645	3539	1613
Grp Volume(v), veh/h	3	0	3	72	1	19	1	742	79	32	633	5
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1688	1900	1615	1810	1695	1597	1645	1770	1613
Q Serve(g_s), s	0.1	0.0	0.1	1.0	0.0	0.6	0.0	4.3	1.3	0.9	5.1	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	1.0	0.0	0.6	0.0	4.3	1.3	0.9	5.1	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	7	0	7	214	121	103	4	2525	793	59	1880	857
V/C Ratio(X)	0.41	0.00	0.46	0.34	0.01	0.19	0.27	0.29	0.10	0.54	0.34	0.01
Avail Cap(c_a), veh/h	1096	0	1305	2045	1535	1305	1096	6162	1936	1993	6433	2933
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	0.0	24.6	22.2	21.7	22.0	24.7	7.3	6.6	23.5	6.6	5.5
Incr Delay (d2), s/veh	32.1	0.0	49.5	0.9	0.0	1.0	36.1	0.1	0.1	7.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.5	0.0	0.3	0.0	2.0	0.6	0.5	2.5	0.0
LnGrp Delay(d),s/veh	56.7	0.0	74.1	23.1	21.8	23.0	60.8	7.4	6.7	30.9	6.8	5.5
LnGrp LOS	E		E	C	C	C	E	A	A	C	A	A
Approach Vol, veh/h		6			92			822			670	
Approach Delay, s/veh		65.4			23.1			7.4			7.9	
Approach LOS		E			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	30.4	7.6	5.2	4.6	32.1	4.7	8.1
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	60.0	60.0	30.0	40.0	30.0	90.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	2.9	6.3	3.0	2.1	2.0	7.1	2.1	2.6
Green Ext Time (p_c), s	0.1	17.8	0.2	0.1	0.0	19.2	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	20	15	761	660	27
Future Volume (veh/h)	37	20	15	761	660	27
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1900	1863	1847	1900
Adj Flow Rate, veh/h	40	22	16	827	717	29
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	0	2	3	3
Cap, veh/h	206	98	37	2501	2901	117
Arrive On Green	0.06	0.06	0.02	0.71	0.58	0.58
Sat Flow, veh/h	3408	1615	1810	3632	5138	200
Grp Volume(v), veh/h	40	22	16	827	484	262
Grp Sat Flow(s),veh/h/ln	1704	1615	1810	1770	1681	1811
Q Serve(g_s), s	0.5	0.6	0.4	3.9	3.1	3.1
Cycle Q Clear(g_c), s	0.5	0.6	0.4	3.9	3.1	3.1
Prop In Lane	1.00	1.00	1.00			0.11
Lane Grp Cap(c), veh/h	206	98	37	2501	1961	1057
V/C Ratio(X)	0.19	0.23	0.44	0.33	0.25	0.25
Avail Cap(c_a), veh/h	3114	1475	1653	8447	4606	2482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	19.6	21.2	2.5	4.4	4.4
Incr Delay (d2), s/veh	0.5	1.2	8.0	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	1.9	1.4	1.6
LnGrp Delay(d),s/veh	20.0	20.7	29.2	2.6	4.5	4.6
LnGrp LOS	C	C	C	A	A	A
Approach Vol, veh/h	62			843	746	
Approach Delay, s/veh	20.3			3.1	4.5	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		7.1	5.4	31.3				36.6
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		40.0	40.0	60.0				104.5
Max Q Clear Time (g_c+I1), s		2.6	2.4	5.1				5.9
Green Ext Time (p_c), s		0.2	0.0	20.5				22.9

Intersection Summary	
HCM 2010 Ctrl Delay	4.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	184	185	40	158	112	165	544	29	103	452	90
Future Volume (veh/h)	125	184	185	40	158	112	165	544	29	103	452	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1881	1863	1839	1900	1827	1858	1900	1863	1863	1827
Adj Flow Rate, veh/h	130	192	193	42	165	117	172	567	30	107	471	94
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	1	2	5	5	4	2	2	2	2	4
Cap, veh/h	170	986	441	69	442	293	308	1194	63	141	1721	515
Arrive On Green	0.10	0.28	0.28	0.04	0.22	0.22	0.09	0.35	0.35	0.08	0.34	0.34
Sat Flow, veh/h	1774	3539	1582	1774	1992	1319	3375	3410	180	1774	5085	1521
Grp Volume(v), veh/h	130	192	193	42	143	139	172	293	304	107	471	94
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1747	1564	1688	1765	1825	1774	1695	1521
Q Serve(g_s), s	5.4	3.1	7.5	1.8	5.2	5.7	3.7	9.7	9.8	4.4	5.1	3.3
Cycle Q Clear(g_c), s	5.4	3.1	7.5	1.8	5.2	5.7	3.7	9.7	9.8	4.4	5.1	3.3
Prop In Lane	1.00		1.00	1.00		0.84	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	170	986	441	69	388	347	308	618	639	141	1721	515
V/C Ratio(X)	0.77	0.19	0.44	0.61	0.37	0.40	0.56	0.47	0.48	0.76	0.27	0.18
Avail Cap(c_a), veh/h	709	2356	1053	1063	1163	1041	1797	705	729	709	3046	911
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	20.7	22.3	35.5	24.8	25.0	32.7	19.0	19.0	33.9	18.1	17.5
Incr Delay (d2), s/veh	7.0	0.3	2.5	8.4	0.8	1.1	3.4	2.1	2.0	8.0	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	1.6	3.6	1.0	2.6	2.6	1.8	5.1	5.2	2.5	2.4	1.4
LnGrp Delay(d),s/veh	40.2	21.0	24.7	43.9	25.6	26.0	36.0	21.1	21.0	41.9	18.2	17.8
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	B	B
Approach Vol, veh/h		515			324			769			672	
Approach Delay, s/veh		27.3			28.2			24.4			21.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	31.3	6.9	26.9	10.9	30.4	11.2	22.7
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	30.0	45.0	50.0	40.0	45.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	6.4	11.8	3.8	9.5	5.7	7.1	7.4	7.7
Green Ext Time (p_c), s	0.3	11.4	0.1	8.9	1.4	17.8	0.3	9.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	23	21	8	10	26	18	317	13	21	415	63
Future Volume (veh/h)	43	23	21	8	10	26	18	317	13	21	415	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1743	1810	1900	1803	1900	1792	1808	1900	1597	1863	1863
Adj Flow Rate, veh/h	47	25	23	9	11	29	20	348	14	23	456	69
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	122	41	360	102	86	379	40	825	33	40	896	745
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.02	0.48	0.48	0.03	0.48	0.48
Sat Flow, veh/h	50	173	1535	22	368	1612	1707	1726	69	1521	1863	1549
Grp Volume(v), veh/h	72	0	23	20	0	29	20	0	362	23	456	69
Grp Sat Flow(s),veh/h/ln	223	0	1535	389	0	1612	1707	0	1795	1521	1863	1549
Q Serve(g_s), s	0.7	0.0	0.6	0.1	0.0	0.8	0.6	0.0	7.1	0.8	9.0	1.3
Cycle Q Clear(g_c), s	12.6	0.0	0.6	12.4	0.0	0.8	0.6	0.0	7.1	0.8	9.0	1.3
Prop In Lane	0.65		1.00	0.45		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	163	0	360	189	0	379	40	0	858	40	896	745
V/C Ratio(X)	0.44	0.00	0.06	0.11	0.00	0.08	0.50	0.00	0.42	0.57	0.51	0.09
Avail Cap(c_a), veh/h	617	0	856	686	0	899	953	0	1336	848	1732	1440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	16.0	16.8	0.0	16.0	25.9	0.0	9.2	25.9	9.6	7.6
Incr Delay (d2), s/veh	2.2	0.0	0.1	0.3	0.0	0.1	10.6	0.0	0.9	13.8	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.3	0.2	0.0	0.3	0.4	0.0	3.6	0.5	4.9	0.6
LnGrp Delay(d),s/veh	23.2	0.0	16.1	17.1	0.0	16.1	36.5	0.0	10.1	39.7	10.8	7.7
LnGrp LOS	C		B	B		B	D		B	D	B	A
Approach Vol, veh/h		95			49			382			548	
Approach Delay, s/veh		21.5			16.5			11.5			11.6	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	31.2		17.5	5.4	31.4		17.5
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	30.0	40.0		30.0	30.0	50.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	9.1		14.6	2.6	11.0		14.4
Green Ext Time (p_c), s	0.0	13.6		0.6	0.0	15.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	51	19	358	67	101	14	445	317	81	380	20
Future Volume (veh/h)	23	51	19	358	67	101	14	445	317	81	380	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1853	1881	1900	1845	1881	1827	1860	1900
Adj Flow Rate, veh/h	24	54	20	432	0	107	15	473	337	86	404	21
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	6	1	0	3	1	4	2	2
Cap, veh/h	143	206	72	657	0	291	26	1389	633	113	1526	79
Arrive On Green	0.08	0.08	0.08	0.18	0.00	0.18	0.01	0.40	0.40	0.07	0.45	0.45
Sat Flow, veh/h	1810	2611	912	3583	0	1586	1810	3505	1597	1740	3414	177
Grp Volume(v), veh/h	24	36	38	432	0	107	15	473	337	86	208	217
Grp Sat Flow(s),veh/h/ln	1810	1805	1718	1792	0	1586	1810	1752	1597	1740	1767	1824
Q Serve(g_s), s	0.8	1.3	1.4	7.5	0.0	4.0	0.6	6.3	10.8	3.3	5.0	5.0
Cycle Q Clear(g_c), s	0.8	1.3	1.4	7.5	0.0	4.0	0.6	6.3	10.8	3.3	5.0	5.0
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	143	143	136	657	0	291	26	1389	633	113	790	815
V/C Ratio(X)	0.17	0.25	0.28	0.66	0.00	0.37	0.57	0.34	0.53	0.76	0.26	0.27
Avail Cap(c_a), veh/h	756	754	718	3208	0	1420	540	3138	1429	909	1582	1633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	29.0	29.1	25.4	0.0	24.0	32.8	14.1	15.5	30.8	11.6	11.6
Incr Delay (d2), s/veh	0.5	0.9	1.1	1.1	0.0	0.8	17.9	0.2	1.0	9.9	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	0.7	3.8	0.0	1.8	0.4	3.1	4.9	1.9	2.4	2.5
LnGrp Delay(d),s/veh	29.4	29.9	30.2	26.5	0.0	24.7	50.7	14.3	16.5	40.7	11.9	11.9
LnGrp LOS	C	C	C	C		C	D	B	B	D	B	B
Approach Vol, veh/h		98			539			825			511	
Approach Delay, s/veh		29.9			26.2			15.9			16.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	31.6		10.3	5.0	35.0		16.8
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	35.0	60.0		28.0	20.0	60.0		60.0
Max Q Clear Time (g_c+I1), s	5.3	12.8		3.4	2.6	7.0		9.5
Green Ext Time (p_c), s	0.2	13.7		0.4	0.0	14.1		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	395	14	22	389	417	43	15	22	375	24	177
Future Volume (veh/h)	173	395	14	22	389	417	43	15	22	375	24	177
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1846	1900	1881	1874	1863
Adj Flow Rate, veh/h	184	420	15	23	414	0	46	16	23	418	0	188
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	213	1205	43	31	864	375	549	208	299	598	0	263
Arrive On Green	0.12	0.34	0.34	0.02	0.24	0.00	0.30	0.30	0.30	0.17	0.00	0.17
Sat Flow, veh/h	1792	3521	126	1723	3574	1553	1810	684	983	3583	0	1572
Grp Volume(v), veh/h	184	213	222	23	414	0	46	0	39	418	0	188
Grp Sat Flow(s),veh/h/ln	1792	1788	1859	1723	1787	1553	1810	0	1667	1792	0	1572
Q Serve(g_s), s	11.6	10.2	10.3	1.5	11.5	0.0	2.1	0.0	1.9	12.7	0.0	13.0
Cycle Q Clear(g_c), s	11.6	10.2	10.3	1.5	11.5	0.0	2.1	0.0	1.9	12.7	0.0	13.0
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	213	612	636	31	864	375	549	0	506	598	0	263
V/C Ratio(X)	0.87	0.35	0.35	0.74	0.48	0.00	0.08	0.00	0.08	0.70	0.00	0.72
Avail Cap(c_a), veh/h	241	698	726	306	1395	606	549	0	506	1088	0	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.9	28.3	28.3	56.3	37.5	0.0	28.7	0.0	28.6	45.3	0.0	45.4
Incr Delay (d2), s/veh	24.4	1.2	1.2	28.3	1.5	0.0	0.3	0.0	0.3	2.1	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	5.3	5.5	1.0	5.8	0.0	1.1	0.0	0.9	6.4	0.0	6.0
LnGrp Delay(d),s/veh	74.3	29.5	29.5	84.7	39.0	0.0	29.0	0.0	28.9	47.4	0.0	50.6
LnGrp LOS	E	C	C	F	D		C		C	D		D
Approach Vol, veh/h		619			437			85			606	
Approach Delay, s/veh		42.8			41.4			29.0			48.4	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.0	6.6	44.5		24.3	18.2	32.9
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		35.0	20.5	45.0		35.0	15.5	45.0
Max Q Clear Time (g_c+I1), s		4.1	3.5	12.3		15.0	13.6	13.5
Green Ext Time (p_c), s		0.4	0.0	14.7		3.3	0.1	14.4

Intersection Summary	
HCM 2010 Ctrl Delay	43.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	466	412	377	706	0	0	0	0	29	2	170
Future Volume (veh/h)	0	466	412	377	706	0	0	0	0	29	2	170
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1845	1863	0				1827	1863	1900
Adj Flow Rate, veh/h	0	491	434	397	743	0				31	2	179
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	3	2	0				4	0	4
Cap, veh/h	0	1613	720	433	2699	0				241	2	217
Arrive On Green	0.00	0.46	0.46	0.25	0.76	0.00				0.14	0.14	0.14
Sat Flow, veh/h	0	3632	1580	1757	3632	0				1740	18	1569
Grp Volume(v), veh/h	0	491	434	397	743	0				31	0	181
Grp Sat Flow(s),veh/h/ln	0	1770	1580	1757	1770	0				1740	0	1586
Q Serve(g_s), s	0.0	8.2	19.2	20.5	5.9	0.0				1.5	0.0	10.3
Cycle Q Clear(g_c), s	0.0	8.2	19.2	20.5	5.9	0.0				1.5	0.0	10.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1613	720	433	2699	0				241	0	220
V/C Ratio(X)	0.00	0.30	0.60	0.92	0.28	0.00				0.13	0.00	0.82
Avail Cap(c_a), veh/h	0	1613	720	604	2699	0				486	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.87	0.87	0.82	0.82	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.0	19.0	34.1	3.3	0.0				35.1	0.0	39.0
Incr Delay (d2), s/veh	0.0	0.4	3.2	10.8	0.2	0.0				0.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	9.0	11.2	2.9	0.0				0.7	0.0	4.7
LnGrp Delay(d),s/veh	0.0	16.4	22.2	44.9	3.5	0.0				35.2	0.0	41.9
LnGrp LOS		B	C	D	A					D		D
Approach Vol, veh/h		925			1140						212	
Approach Delay, s/veh		19.1			17.9						40.9	
Approach LOS		B			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	28.5	47.5		17.0		76.0		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	32.0	20.4		26.0		58.0		
Max Q Clear Time (g_c+I1), s	22.5	21.2		12.3		7.9		
Green Ext Time (p_c), s	0.5	0.0		0.6		8.3		

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	349	0	0	610	73	473	3	370	0	0	0
Future Volume (veh/h)	146	349	0	0	610	73	473	3	370	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1850	1900	1845	1833	1827			
Adj Flow Rate, veh/h	162	388	0	0	678	81	655	0	275			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	1	1	0	0	3	3	3	33	4			
Cap, veh/h	196	2366	0	0	1631	195	863	0	381			
Arrive On Green	0.11	0.66	0.00	0.00	0.52	0.52	0.25	0.00	0.25			
Sat Flow, veh/h	1792	3668	0	0	3257	378	3514	0	1553			
Grp Volume(v), veh/h	162	388	0	0	376	383	655	0	275			
Grp Sat Flow(s),veh/h/ln	1792	1787	0	0	1758	1784	1757	0	1553			
Q Serve(g_s), s	8.3	3.9	0.0	0.0	12.4	12.4	16.3	0.0	15.3			
Cycle Q Clear(g_c), s	8.3	3.9	0.0	0.0	12.4	12.4	16.3	0.0	15.3			
Prop In Lane	1.00		0.00	0.00		0.21	1.00		1.00			
Lane Grp Cap(c), veh/h	196	2366	0	0	906	920	863	0	381			
V/C Ratio(X)	0.83	0.16	0.00	0.00	0.42	0.42	0.76	0.00	0.72			
Avail Cap(c_a), veh/h	286	2366	0	0	906	920	1234	0	545			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.95	0.95	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.0	6.0	0.0	0.0	14.0	14.0	32.9	0.0	32.5			
Incr Delay (d2), s/veh	7.9	0.1	0.0	0.0	1.3	1.3	2.3	0.0	3.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.6	1.9	0.0	0.0	6.3	6.4	8.2	0.0	7.0			
LnGrp Delay(d),s/veh	48.9	6.2	0.0	0.0	15.4	15.4	35.1	0.0	36.2			
LnGrp LOS	D	A			B	B	D		D			
Approach Vol, veh/h		550			759			930				
Approach Delay, s/veh		18.8			15.4			35.5				
Approach LOS		B			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		66.8			13.8	53.1		27.2
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		52.0			15.0	33.5		33.0
Max Q Clear Time (g_c+I1), s		5.9			10.3	14.4		18.3
Green Ext Time (p_c), s		5.7			0.1	5.0		4.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	552	84	12	592	0	91	0	16	0	0	0
Future Volume (veh/h)	59	552	84	12	592	0	91	0	16	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1865	1900	1900	1845	0	1900	0	1900			
Adj Flow Rate, veh/h	64	600	91	13	643	0	99	0	17			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	0	3	0	0	0	0			
Cap, veh/h	124	2025	306	24	2112	0	142	0	127			
Arrive On Green	0.07	0.66	0.66	0.01	0.60	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3076	465	1810	3597	0	1810	0	1615			
Grp Volume(v), veh/h	64	345	346	13	643	0	99	0	17			
Grp Sat Flow(s),veh/h/ln	1810	1772	1770	1810	1752	0	1810	0	1615			
Q Serve(g_s), s	1.8	4.5	4.5	0.4	4.8	0.0	2.9	0.0	0.5			
Cycle Q Clear(g_c), s	1.8	4.5	4.5	0.4	4.8	0.0	2.9	0.0	0.5			
Prop In Lane	1.00		0.26	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	124	1166	1165	24	2112	0	142	0	127			
V/C Ratio(X)	0.52	0.30	0.30	0.55	0.30	0.00	0.70	0.00	0.13			
Avail Cap(c_a), veh/h	838	1642	1640	838	3247	0	838	0	748			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.3	3.9	3.9	26.5	5.2	0.0	24.2	0.0	23.2			
Incr Delay (d2), s/veh	3.3	0.4	0.4	18.2	0.2	0.0	6.0	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.0	2.2	2.2	0.3	2.4	0.0	1.7	0.0	0.3			
LnGrp Delay(d),s/veh	27.6	4.3	4.3	44.7	5.4	0.0	30.2	0.0	23.6			
LnGrp LOS	C	A	A	D	A		C		C			
Approach Vol, veh/h		755			656			116				
Approach Delay, s/veh		6.3			6.2			29.3				
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.7	40.5			7.7	37.5		8.7
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	25.0	50.0			25.0	50.0		25.0
Max Q Clear Time (g_c+I1), s	2.4	6.5			3.8	6.8		4.9
Green Ext Time (p_c), s	0.0	25.8			0.1	25.7		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	671	784	0
Future Vol, veh/h	0	0	7	671	784	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	692	808	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	404	808	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	602	826	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	602	826	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	826	-	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	9.4	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	45	59	368	289	35
Future Vol, veh/h	42	45	59	368	289	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	2	1	9
Mvmt Flow	46	49	64	400	314	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	661	176	352	0	-	0
Stage 1	333	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	400	843	1182	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	378	843	1182	-	-	-
Mov Cap-2 Maneuver	378	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	670	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1182	-	378	843	-	-
HCM Lane V/C Ratio	0.054	-	0.121	0.058	-	-
HCM Control Delay (s)	8.2	-	15.8	9.5	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	493	85	19	532	8	97	1	15	18	3	85
Future Volume (veh/h)	33	493	85	19	532	8	97	1	15	18	3	85
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1868	1900	1900	1863	1900	1900	1783	1900	1900	1900	1900
Adj Flow Rate, veh/h	35	519	89	20	560	8	102	1	16	19	3	89
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	70	1245	213	100	1600	23	149	7	119	126	20	129
Arrive On Green	0.04	0.41	0.41	0.06	0.45	0.45	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1810	3033	518	1810	3573	51	1810	90	1439	1573	248	1615
Grp Volume(v), veh/h	35	303	305	20	277	291	102	0	17	22	0	89
Grp Sat Flow(s),veh/h/ln	1810	1775	1777	1810	1770	1854	1810	0	1529	1821	0	1615
Q Serve(g_s), s	0.9	5.9	5.9	0.5	5.0	5.0	2.7	0.0	0.5	0.5	0.0	2.6
Cycle Q Clear(g_c), s	0.9	5.9	5.9	0.5	5.0	5.0	2.7	0.0	0.5	0.5	0.0	2.6
Prop In Lane	1.00		0.29	1.00		0.03	1.00		0.94	0.86		1.00
Lane Grp Cap(c), veh/h	70	729	729	100	793	830	149	0	126	146	0	129
V/C Ratio(X)	0.50	0.42	0.42	0.20	0.35	0.35	0.68	0.00	0.13	0.15	0.00	0.69
Avail Cap(c_a), veh/h	1121	2198	2201	1121	2193	2297	1121	0	947	1128	0	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.8	10.1	10.2	21.8	8.8	8.8	21.6	0.0	20.6	20.7	0.0	21.7
Incr Delay (d2), s/veh	5.4	1.4	1.4	1.0	1.0	0.9	5.4	0.0	0.5	0.5	0.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.1	3.2	0.3	2.6	2.7	1.6	0.0	0.2	0.3	0.0	1.4
LnGrp Delay(d),s/veh	28.2	11.5	11.6	22.8	9.7	9.7	27.0	0.0	21.1	21.2	0.0	28.1
LnGrp LOS	C	B	B	C	A	A	C		C	C		C
Approach Vol, veh/h		643			588			119			111	
Approach Delay, s/veh		12.4			10.1			26.2			26.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	24.9		8.0	5.9	26.7		7.9
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	30.0	* 60		30.0	30.0	60.0		30.0
Max Q Clear Time (g_c+I1), s	2.5	7.9		4.7	2.9	7.0		4.6
Green Ext Time (p_c), s	8.9	12.0		0.3	0.1	10.9		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	195	189	292	174	4	221	3	100	3	2	11
Future Vol, veh/h	6	195	189	292	174	4	221	3	100	3	2	11
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	17	6	5	2	6	0	4	0	6	0	0	0
Mvmt Flow	7	241	233	360	215	5	273	4	123	4	2	14
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	15.8	23.5	19.3	11.6
HCM LOS	C	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	99%	0%	3%	0%	100%	0%	19%
Vol Thru, %	1%	0%	97%	0%	0%	98%	12%
Vol Right, %	0%	100%	0%	100%	0%	2%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	224	100	201	189	292	178	16
LT Vol	221	0	6	0	292	0	3
Through Vol	3	0	195	0	0	174	2
RT Vol	0	100	0	189	0	4	11
Lane Flow Rate	277	123	248	233	360	220	20
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.617	0.231	0.51	0.42	0.744	0.426	0.045
Departure Headway (Hd)	8.031	6.741	7.398	6.473	7.43	6.972	8.205
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	454	536	489	555	487	516	436
Service Time	5.731	4.441	5.137	4.213	5.169	4.71	6.26
HCM Lane V/C Ratio	0.61	0.229	0.507	0.42	0.739	0.426	0.046
HCM Control Delay	22.8	11.5	17.6	13.8	28.8	14.8	11.6
HCM Lane LOS	C	B	C	B	D	B	B
HCM 95th-tile Q	4.1	0.9	2.8	2.1	6.2	2.1	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	55	427	1	34	357
Future Vol, veh/h	6	55	427	1	34	357
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	3	0	12	4
Mvmt Flow	6	57	445	1	35	372

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	888	445	0	0	446	0
Stage 1	445	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.22	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.308	-
Pot Cap-1 Maneuver	317	617	-	-	1063	-
Stage 1	650	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	307	617	-	-	1063	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	630	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	561	1063	-
HCM Lane V/C Ratio	-	-	0.113	0.033	-
HCM Control Delay (s)	-	-	12.2	8.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	3	43	1	2	6	429	26	6	383	2
Future Vol, veh/h	1	3	3	43	1	2	6	429	26	6	383	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	4	8	0	4	50
Mvmt Flow	1	3	3	47	1	2	7	466	28	7	416	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	910	909	417	911	911	466	418	0	0	466	0	0
Stage 1	430	430	-	479	479	-	-	-	-	-	-	-
Stage 2	480	479	-	432	432	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	258	277	640	257	276	601	1152	-	-	1106	-	-
Stage 1	607	587	-	571	558	-	-	-	-	-	-	-
Stage 2	571	558	-	606	586	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	254	274	640	251	273	601	1152	-	-	1106	-	-
Mov Cap-2 Maneuver	254	274	-	251	273	-	-	-	-	-	-	-
Stage 1	603	583	-	568	555	-	-	-	-	-	-	-
Stage 2	564	555	-	596	582	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.2	22.2	0.1	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1152	-	-	269	640	251	601	1106	-	-
HCM Lane V/C Ratio	0.006	-	-	0.016	0.005	0.191	0.004	0.006	-	-
HCM Control Delay (s)	8.1	-	-	18.6	10.7	22.7	11	8.3	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.7	0	0	-	-

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	29	114	57	11	4	91	125	37	7	120	57
Future Vol, veh/h	87	29	114	57	11	4	91	125	37	7	120	57
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles, %	3	0	1	2	0	0	0	2	5	0	3	4
Mvmt Flow	143	48	187	93	18	7	149	205	61	11	197	93
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	14.8	14.7	16.8	14.4
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	75%	0%	79%	100%	0%	0%
Vol Thru, %	0%	77%	25%	0%	15%	0%	100%	0%
Vol Right, %	0%	23%	0%	100%	6%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	162	116	114	72	7	120	57
LT Vol	91	0	87	0	57	7	0	0
Through Vol	0	125	29	0	11	0	120	0
RT Vol	0	37	0	114	4	0	0	57
Lane Flow Rate	149	266	190	187	118	11	197	93
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.327	0.535	0.419	0.352	0.282	0.026	0.422	0.182
Departure Headway (Hd)	7.893	7.251	7.93	6.786	8.593	8.177	7.717	7.016
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	455	497	453	529	418	437	466	510
Service Time	5.652	5.009	5.688	4.543	6.362	5.939	5.478	4.778
HCM Lane V/C Ratio	0.327	0.535	0.419	0.353	0.282	0.025	0.423	0.182
HCM Control Delay	14.5	18.1	16.3	13.2	14.7	11.2	16	11.3
HCM Lane LOS	B	C	C	B	B	B	C	B
HCM 95th-tile Q	1.4	3.1	2	1.6	1.1	0.1	2.1	0.7

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	23	268	260	2
Future Vol, veh/h	1	11	23	268	260	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	4	3	2	0
Mvmt Flow	1	12	26	298	289	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	639	290	291	0	-	0
Stage 1	290	-	-	-	-	-
Stage 2	349	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	443	754	1259	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	434	754	1259	-	-	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	704	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1259	-	710	-	-
HCM Lane V/C Ratio	0.02	-	0.019	-	-
HCM Control Delay (s)	7.9	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	125	166	27	124	147
Future Vol, veh/h	35	125	166	27	124	147
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	4	15	2	3
Mvmt Flow	38	136	180	29	135	160

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	624	195	0	0	210	0
Stage 1	195	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	452	851	-	-	1361	-
Stage 1	843	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	407	851	-	-	1361	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	595	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	3.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	687	1361	-
HCM Lane V/C Ratio	-	-	0.253	0.099	-
HCM Control Delay (s)	-	-	12	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1	0.3	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	225	3	0	184
Future Vol, veh/h	1	1	225	3	0	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	2	2	469	6	0	383

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	855	472	0	0	475	0
Stage 1	472	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	331	596	-	-	1098	-
Stage 1	632	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	331	596	-	-	1098	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	694	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	331	596	1098	-
HCM Lane V/C Ratio	-	-	0.006	0.003	-	-
HCM Control Delay (s)	-	-	15.9	11.1	0	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	29	0	13	2	215	35	13	172	0
Future Vol, veh/h	0	0	1	29	0	13	2	215	35	13	172	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	51	51	51	51	51	51	51	51	51	51	51	51
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	2	0
Mvmt Flow	0	0	2	57	0	25	4	422	69	25	337	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	864	886	337	853	852	456	337	0	0	490	0	0
Stage 1	388	388	-	464	464	-	-	-	-	-	-	-
Stage 2	476	498	-	389	388	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	277	286	710	281	299	609	1234	-	-	1084	-	-
Stage 1	640	612	-	582	567	-	-	-	-	-	-	-
Stage 2	574	548	-	639	612	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	260	278	710	275	291	609	1234	-	-	1084	-	-
Mov Cap-2 Maneuver	260	278	-	275	291	-	-	-	-	-	-	-
Stage 1	638	598	-	580	565	-	-	-	-	-	-	-
Stage 2	548	546	-	623	598	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	19.4	0.1	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1234	-	-	710	331	1084	-	-
HCM Lane V/C Ratio	0.003	-	-	0.003	0.249	0.024	-	-
HCM Control Delay (s)	7.9	-	-	10.1	19.4	8.4	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	17	235	69	7	195
Future Vol, veh/h	68	17	235	69	7	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	52	52	52	52	52	52
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	131	33	452	133	13	375

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	920	518	0	0	585	0
Stage 1	518	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	303	562	-	-	1000	-
Stage 1	602	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	299	562	-	-	1000	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	602	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	425	562	1000	-
HCM Lane V/C Ratio	-	-	0.308	0.058	0.013	-
HCM Control Delay (s)	-	-	17.2	11.8	8.6	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.3	0.2	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	29	277	254	1
Future Vol, veh/h	0	17	29	277	254	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	55	55	55	55
Heavy Vehicles, %	0	12	10	1	1	0
Mvmt Flow	0	31	53	504	462	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1072	463	464	0	-	0
Stage 1	463	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.29	-	-	-
Pot Cap-1 Maneuver	246	579	1057	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	234	579	1057	-	-	-
Mov Cap-2 Maneuver	366	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1057	-	579	-	-
HCM Lane V/C Ratio	0.05	-	0.053	-	-
HCM Control Delay (s)	8.6	-	11.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	141	9	2	19	103	443	5	5	525	8
Future Vol, veh/h	0	0	141	9	2	19	103	443	5	5	525	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	193	12	3	26	141	607	7	7	719	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	719	1625	1625	610	719	0	0	614	0	0
Stage 1	-	-	-	892	892	-	-	-	-	-	-	-
Stage 2	-	-	-	733	733	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	425	74	103	489	887	-	-	975	-	-
Stage 1	0	0	-	311	363	-	-	-	-	-	-	-
Stage 2	0	0	-	383	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	425	35	86	489	887	-	-	975	-	-
Mov Cap-2 Maneuver	-	-	-	35	86	-	-	-	-	-	-	-
Stage 1	-	-	-	262	305	-	-	-	-	-	-	-
Stage 2	-	-	-	207	426	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	70.2	1.8	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	425	94	975	-	-
HCM Lane V/C Ratio	0.159	-	-	0.454	0.437	0.007	-	-
HCM Control Delay (s)	9.8	-	-	20.3	70.2	8.7	-	-
HCM Lane LOS	A	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	2.3	1.8	0	-	-

Existing Plus Project Conditions

Project Driveway Option A

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	118	225	136	133	125	211	364	81	40	304	112
Future Volume (veh/h)	171	118	225	136	133	125	211	364	81	40	304	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1727	1727	1827	1844	1900	1827	1863	1863	1900	1819	1900
Adj Flow Rate, veh/h	197	136	259	156	153	144	243	418	93	46	349	129
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	10	10	4	5	5	4	2	2	0	5	5
Cap, veh/h	381	375	311	371	186	175	284	637	533	59	504	182
Arrive On Green	0.22	0.22	0.22	0.21	0.21	0.21	0.16	0.34	0.34	0.03	0.21	0.21
Sat Flow, veh/h	1757	1727	1433	1740	870	819	1740	1863	1558	1810	2451	887
Grp Volume(v), veh/h	197	136	259	156	0	297	243	418	93	46	244	234
Grp Sat Flow(s),veh/h/ln	1757	1727	1433	1740	0	1688	1740	1863	1558	1810	1728	1610
Q Serve(g_s), s	8.9	6.0	15.5	6.9	0.0	15.1	12.2	17.1	3.7	2.3	11.7	12.1
Cycle Q Clear(g_c), s	8.9	6.0	15.5	6.9	0.0	15.1	12.2	17.1	3.7	2.3	11.7	12.1
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	381	375	311	371	0	360	284	637	533	59	355	331
V/C Ratio(X)	0.52	0.36	0.83	0.42	0.00	0.82	0.85	0.66	0.17	0.78	0.69	0.71
Avail Cap(c_a), veh/h	548	539	447	543	0	527	485	831	695	514	771	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	29.9	33.6	30.5	0.0	33.7	36.5	25.0	20.7	43.1	33.0	33.1
Incr Delay (d2), s/veh	0.4	0.2	6.0	0.3	0.0	4.4	7.3	0.5	0.1	7.9	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.9	6.7	3.4	0.0	7.5	6.4	8.8	1.6	1.3	5.6	5.5
LnGrp Delay(d),s/veh	31.4	30.1	39.6	30.8	0.0	38.1	43.8	25.5	20.7	50.9	33.8	34.2
LnGrp LOS	C	C	D	C		D	D	C	C	D	C	C
Approach Vol, veh/h		592			453			754			524	
Approach Delay, s/veh		34.7			35.5			30.8			35.5	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	36.2		23.5	19.2	23.9		23.1
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	25.5	40.0		28.0	25.0	40.0		28.0
Max Q Clear Time (g_c+I1), s	4.3	19.1		17.5	14.2	14.1		17.1
Green Ext Time (p_c), s	0.0	3.9		1.0	0.5	4.1		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	45	11	50	7	490	2	332	55	428	347	1
Future Volume (veh/h)	6	45	11	50	7	490	2	332	55	428	347	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1813	1900	1900	1900	1827	1900	1827	1827	1827	1793	1900
Adj Flow Rate, veh/h	6	48	12	54	8	527	2	357	59	460	373	1
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	4	0	4	4	4	6	6
Cap, veh/h	76	373	86	451	60	821	3	517	433	435	950	3
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.00	0.28	0.28	0.25	0.53	0.53
Sat Flow, veh/h	52	1337	309	1239	215	1547	1810	1827	1531	1740	1787	5
Grp Volume(v), veh/h	66	0	0	62	0	527	2	357	59	460	0	374
Grp Sat Flow(s),veh/h/ln	1697	0	0	1454	0	1547	1810	1827	1531	1740	0	1792
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	15.5	0.1	11.1	1.8	16.0	0.0	7.9
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.6	0.0	15.5	0.1	11.1	1.8	16.0	0.0	7.9
Prop In Lane	0.09		0.18	0.87		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	536	0	0	511	0	821	3	517	433	435	0	952
V/C Ratio(X)	0.12	0.00	0.00	0.12	0.00	0.64	0.67	0.69	0.14	1.06	0.00	0.39
Avail Cap(c_a), veh/h	588	0	0	525	0	836	453	1028	861	435	0	1008
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	17.2	0.0	10.7	31.9	20.4	17.1	24.0	0.0	8.9
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	1.6	68.8	1.7	0.1	59.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.8	0.0	7.0	0.1	5.8	0.8	14.8	0.0	3.9
LnGrp Delay(d),s/veh	17.4	0.0	0.0	17.3	0.0	12.4	100.8	22.1	17.2	83.0	0.0	9.1
LnGrp LOS	B			B		B	F	C	B	F		A
Approach Vol, veh/h		66			589			418			834	
Approach Delay, s/veh		17.4			12.9			21.8			49.9	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	22.1		21.9	4.1	38.0		21.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	36.0		20.0	16.0	36.0		18.5
Max Q Clear Time (g_c+I1), s	18.0	13.1		3.8	2.1	9.9		17.5
Green Ext Time (p_c), s	0.0	5.0		2.6	0.0	5.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Future Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1841	1845	1863	1804	1900	1863	1835	1900	1900	1810	1810
Adj Flow Rate, veh/h	64	35	133	55	57	29	182	563	68	20	241	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	3	2	8	8	2	4	4	0	5	5
Cap, veh/h	157	86	213	208	132	67	236	1168	141	45	479	407
Arrive On Green	0.14	0.14	0.14	0.12	0.12	0.12	0.13	0.37	0.37	0.02	0.26	0.00
Sat Flow, veh/h	1153	630	1568	1774	1129	574	1774	3133	377	1810	1810	1538
Grp Volume(v), veh/h	99	0	133	55	0	86	182	313	318	20	241	0
Grp Sat Flow(s),veh/h/ln	1783	0	1568	1774	0	1703	1774	1743	1768	1810	1810	1538
Q Serve(g_s), s	2.1	0.0	3.3	1.2	0.0	1.9	4.1	5.6	5.6	0.4	4.6	0.0
Cycle Q Clear(g_c), s	2.1	0.0	3.3	1.2	0.0	1.9	4.1	5.6	5.6	0.4	4.6	0.0
Prop In Lane	0.65		1.00	1.00		0.34	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	243	0	213	208	0	199	236	650	659	45	479	407
V/C Ratio(X)	0.41	0.00	0.62	0.26	0.00	0.43	0.77	0.48	0.48	0.44	0.50	0.00
Avail Cap(c_a), veh/h	1306	0	1149	1083	0	1040	867	1703	1727	884	1768	1503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.2	0.0	16.7	16.5	0.0	16.8	17.1	9.8	9.8	19.7	12.8	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.1	0.2	0.0	0.5	2.0	0.3	0.3	2.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.5	0.6	0.0	0.9	2.1	2.7	2.8	0.3	2.3	0.0
LnGrp Delay(d),s/veh	16.6	0.0	17.8	16.7	0.0	17.4	19.2	10.1	10.1	22.2	13.2	0.0
LnGrp LOS	B		B	B		B	B	B	B	C	B	
Approach Vol, veh/h		232			141			813			261	
Approach Delay, s/veh		17.3			17.1			12.1			13.9	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.0	19.0		9.1	8.4	14.5		8.9
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		25.0
Max Q Clear Time (g_c+I1), s	2.4	7.6		5.3	6.1	6.6		3.9
Green Ext Time (p_c), s	0.0	4.2		0.5	0.2	4.2		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	26.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	393	347	88	80	309
Future Vol, veh/h	92	393	347	88	80	309
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	3	6	10	2
Mvmt Flow	101	432	381	97	88	340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	896	381	0	0	381	0
Stage 1	381	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.29	-
Pot Cap-1 Maneuver	311	662	-	-	1135	-
Stage 1	691	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	281	662	-	-	1135	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.2	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	527	1135	-
HCM Lane V/C Ratio	-	-	1.011	0.077	-
HCM Control Delay (s)	-	-	70.2	8.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	14.5	0.3	-

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	118	24	67	95	34	68
Future Vol, veh/h	118	24	67	95	34	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	9	7	3	18	6
Mvmt Flow	134	27	76	108	39	77

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	161	0	408	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	260	-
Critical Hdwy	-	-	4.17	-	6.58	6.26
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.263	-	3.662	3.354
Pot Cap-1 Maneuver	-	-	1388	-	570	888
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1388	-	537	888
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	729	-	-	1388	-
HCM Lane V/C Ratio	0.159	-	-	0.055	-
HCM Control Delay (s)	10.9	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	172	88	213	179	21	154	285	161	28	602	110
Future Volume (veh/h)	62	172	88	213	179	21	154	285	161	28	602	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1743	1863	1743	1810	1727	1792	1810	1827	1863	1881
Adj Flow Rate, veh/h	66	183	94	227	190	22	164	303	171	30	640	117
Adj No. of Lanes	1	1	1	2	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	9	2	9	5	10	6	5	4	2	1
Cap, veh/h	85	308	254	325	377	326	201	860	883	41	710	610
Arrive On Green	0.05	0.17	0.17	0.09	0.22	0.22	0.12	0.48	0.48	0.02	0.38	0.38
Sat Flow, veh/h	1707	1792	1482	3442	1743	1505	1645	1792	1538	1740	1863	1599
Grp Volume(v), veh/h	66	183	94	227	190	22	164	303	171	30	640	117
Grp Sat Flow(s),veh/h/ln	1707	1792	1482	1721	1743	1505	1645	1792	1538	1740	1863	1599
Q Serve(g_s), s	3.3	8.2	4.9	5.5	8.3	1.0	8.4	9.2	4.6	1.5	28.1	4.2
Cycle Q Clear(g_c), s	3.3	8.2	4.9	5.5	8.3	1.0	8.4	9.2	4.6	1.5	28.1	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	308	254	325	377	326	201	860	883	41	710	610
V/C Ratio(X)	0.78	0.59	0.37	0.70	0.50	0.07	0.82	0.35	0.19	0.73	0.90	0.19
Avail Cap(c_a), veh/h	394	620	512	992	703	607	474	860	883	401	751	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	33.1	31.8	38.1	29.9	27.0	37.1	14.1	8.9	42.1	25.3	17.9
Incr Delay (d2), s/veh	14.0	3.9	1.9	2.7	2.2	0.2	7.9	0.5	0.2	21.3	14.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.3	2.1	2.8	4.2	0.4	4.3	4.7	2.0	1.0	17.3	1.9
LnGrp Delay(d),s/veh	54.8	37.0	33.7	40.8	32.1	27.2	45.0	14.7	9.1	63.4	39.9	18.2
LnGrp LOS	D	D	C	D	C	C	D	B	A	E	D	B
Approach Vol, veh/h		343			439			638			787	
Approach Delay, s/veh		39.5			36.4			21.0			37.6	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	47.1	12.7	20.4	15.1	38.6	8.8	24.3
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	20.0	40.0	25.0	30.0	25.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	3.5	11.2	7.5	10.2	10.4	30.1	5.3	10.3
Green Ext Time (p_c), s	0.0	16.0	0.7	4.7	0.4	3.0	0.1	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	32.8
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	104	0	93	0	522	50	127	776	1
Future Volume (vph)	0	0	104	104	0	93	0	522	50	127	776	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1448	1770		1495		3406	1583	1736	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1448	1770		1495		3406	1583	1736	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	111	0	99	0	555	53	135	826	1
RTOR Reduction (vph)	0	0	105	0	0	74	0	0	27	0	0	0
Lane Group Flow (vph)	0	0	6	111	0	25	0	555	26	135	827	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			3.0	5.5		13.0		19.9	25.4	5.2	29.1	
Effective Green, g (s)			3.0	5.5		13.0		19.9	25.4	5.2	29.1	
Actuated g/C Ratio			0.06	0.11		0.25		0.39	0.49	0.10	0.56	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			84	188		376		1313	779	174	1995	
v/s Ratio Prot				c0.06				0.16	0.00	c0.08	c0.23	
v/s Ratio Perm			0.00			c0.02			0.01			
v/c Ratio			0.08	0.59		0.07		0.42	0.03	0.78	0.41	
Uniform Delay, d1			23.0	22.0		14.7		11.6	6.8	22.6	6.4	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.4	4.9		0.1		0.3	0.0	17.7	0.2	
Delay (s)			23.4	26.9		14.8		11.9	6.8	40.3	6.6	
Level of Service			C	C		B		B	A	D	A	
Approach Delay (s)		23.4			21.2			11.5			11.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

07/15/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	23	109	149	41	28	225	588	113	89	902	86
Future Volume (veh/h)	74	23	109	149	41	28	225	588	113	89	902	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1776	1881	1743	1845	1863
Adj Flow Rate, veh/h	77	24	114	155	43	29	234	612	118	93	940	90
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	1	9	3	2
Cap, veh/h	99	129	182	190	224	196	277	1870	885	118	1624	724
Arrive On Green	0.06	0.07	0.07	0.12	0.13	0.13	0.16	0.55	0.55	0.07	0.46	0.46
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	3374	1598	1660	3505	1562
Grp Volume(v), veh/h	77	24	114	155	43	29	234	612	118	93	940	90
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1687	1598	1660	1752	1562
Q Serve(g_s), s	4.2	1.2	4.2	8.5	2.0	1.6	12.2	9.1	3.3	5.1	18.1	3.0
Cycle Q Clear(g_c), s	4.2	1.2	4.2	8.5	2.0	1.6	12.2	9.1	3.3	5.1	18.1	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	129	182	190	224	196	277	1870	885	118	1624	724
V/C Ratio(X)	0.78	0.19	0.63	0.81	0.19	0.15	0.85	0.33	0.13	0.79	0.58	0.12
Avail Cap(c_a), veh/h	537	569	799	537	563	492	835	1870	885	361	1905	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	40.0	41.3	39.7	35.7	35.5	37.4	11.2	9.9	42.0	18.1	14.1
Incr Delay (d2), s/veh	12.4	0.7	3.5	8.2	0.4	0.3	7.0	0.2	0.1	10.9	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.6	1.5	4.3	1.0	0.7	6.3	4.2	1.5	2.7	8.9	1.3
LnGrp Delay(d),s/veh	55.0	40.7	44.9	47.9	36.1	35.9	44.4	11.4	10.0	52.9	18.8	14.2
LnGrp LOS	E	D	D	D	D	D	D	B	B	D	B	B
Approach Vol, veh/h		215			227			964			1123	
Approach Delay, s/veh		48.1			44.1			19.2			21.3	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	56.0	14.6	10.8	18.9	47.6	9.5	15.9
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	7.1	11.1	10.5	6.2	14.2	20.1	6.2	4.0
Green Ext Time (p_c), s	0.2	28.4	0.4	0.9	0.7	22.5	0.2	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	64	609	64	288	76	675	145	0	1134	38
Future Volume (veh/h)	5	0	64	609	64	288	76	675	145	0	1134	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1759	1845	1805	1776	1827	1792	1681	0	1696	1900
Adj Flow Rate, veh/h	5	0	70	669	0	363	84	742	159	0	1246	42
Adj No. of Lanes	1	0	1	2	0	2	1	3	1	0	3	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	8	3	2	7	4	6	13	0	12	0
Cap, veh/h	12	0	0	808	0	482	119	2682	783	0	1842	642
Arrive On Green	0.01	0.00	0.00	0.23	0.00	0.16	0.07	0.55	0.55	0.00	0.40	0.40
Sat Flow, veh/h	1810	5		3514	0	3019	1740	4893	1429	0	4784	1615
Grp Volume(v), veh/h	5	33.4		669	0	363	84	742	159	0	1246	42
Grp Sat Flow(s),veh/h/ln	1810	C		1757	0	1509	1740	1631	1429	0	1544	1615
Q Serve(g_s), s	0.1			9.3	0.0	5.9	2.4	4.1	2.9	0.0	11.3	0.8
Cycle Q Clear(g_c), s	0.1			9.3	0.0	5.9	2.4	4.1	2.9	0.0	11.3	0.8
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	12			808	0	482	119	2682	783	0	1842	642
V/C Ratio(X)	0.41			0.83	0.00	0.75	0.71	0.28	0.20	0.00	0.68	0.07
Avail Cap(c_a), veh/h	708			4087	0	2066	1021	6620	1934	0	3169	1105
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	25.3			18.7	0.0	20.5	23.3	6.2	5.9	0.0	12.7	9.5
Incr Delay (d2), s/veh	8.1			0.8	0.0	0.9	2.9	0.0	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1			4.6	0.0	2.5	1.3	1.9	1.1	0.0	4.8	0.4
LnGrp Delay(d),s/veh	33.4			19.6	0.0	21.4	26.2	6.2	5.9	0.0	12.9	9.5
LnGrp LOS	C			B		C	C	A	A		B	A
Approach Vol, veh/h					1032			985			1288	
Approach Delay, s/veh					20.2			7.8			12.7	
Approach LOS					C			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		33.7	16.2		7.7	26.0	4.4	13.0
Change Period (Y+Rc), s		5.7	4.4		* 4.2	5.7	4.1	4.8
Max Green Setting (Gmax), s		69.2	59.5		* 30	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s		6.1	11.3		4.4	13.3	2.1	7.9
Green Ext Time (p_c), s		7.9	0.5		0.0	7.0	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	352	94	183	39	0	94	0	767	20	172	1011	230
Future Volume (veh/h)	352	94	183	39	0	94	0	767	20	172	1011	230
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1845	1776	1845	0	1863	0	1667	1792	1863	1863	1743
Adj Flow Rate, veh/h	405	108	210	45	0	108	0	882	23	198	1162	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	7	3	7	3	0	2	0	14	6	2	2	9
Cap, veh/h	581	622	268	114	0	0	0	1822	484	319	1739	728
Arrive On Green	0.18	0.18	0.18	0.06	0.00	0.00	0.00	0.32	0.32	0.09	0.49	0.00
Sat Flow, veh/h	3281	3505	1509	1757	45		0	5967	1524	3442	3539	1482
Grp Volume(v), veh/h	405	108	210	45	23.6		0	882	23	198	1162	0
Grp Sat Flow(s),veh/h/ln	1640	1752	1509	1757	C		0	1433	1524	1721	1770	1482
Q Serve(g_s), s	5.9	1.3	6.7	1.2			0.0	6.3	0.5	2.8	12.6	0.0
Cycle Q Clear(g_c), s	5.9	1.3	6.7	1.2			0.0	6.3	0.5	2.8	12.6	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	581	622	268	114			0	1822	484	319	1739	728
V/C Ratio(X)	0.70	0.17	0.78	0.40			0.00	0.48	0.05	0.62	0.67	0.00
Avail Cap(c_a), veh/h	3239	2422	1043	1387			0	5093	1354	1699	5178	2168
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.6	17.7	19.9	22.7			0.0	13.9	12.0	22.1	9.8	0.0
Incr Delay (d2), s/veh	1.1	0.0	1.9	0.8			0.0	0.1	0.0	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.6	2.9	0.6			0.0	2.5	0.2	1.4	6.0	0.0
LnGrp Delay(d),s/veh	20.7	17.7	21.8	23.6			0.0	14.0	12.0	22.9	9.9	0.0
LnGrp LOS	C	B	C	C				B	B	C	A	
Approach Vol, veh/h		723						905			1360	
Approach Delay, s/veh		20.6						14.0			11.8	
Approach LOS		C						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	8.8	21.8	7.0	13.1		30.6	13.1	
Change Period (Y+Rc), s	4.1	5.7	3.7	4.1		5.7	4.1	
Max Green Setting (Gmax), s	25.0	45.0	40.0	35.0		74.1	50.0	
Max Q Clear Time (g_c+I1), s	4.8	8.3	3.2	8.7		14.6	7.9	
Green Ext Time (p_c), s	0.1	7.8	0.0	0.4		8.0	1.1	

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

HCM Unsignalized Intersection Capacity Analysis
11: Sierra College Blvd & Schriber Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	79	708	21	0	1233
Future Volume (Veh/h)	0	79	708	21	0	1233
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	98	874	26	0	1522
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			443			404
pX, platoon unblocked	0.76	0.96			0.96	
vC, conflicting volume	1649	232			901	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	867	17			711	
tC, single (s)	6.8	7.4			5.1	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.7	
p0 queue free %	100	90			100	
cM capacity (veh/h)	225	953			605	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	98	250	250	250	151	761	761
Volume Left	0	0	0	0	0	0	0
Volume Right	98	0	0	0	26	0	0
cSH	953	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.15	0.15	0.15	0.09	0.45	0.45
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.2	0.0				0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	1	36	1	4	0	723	22	35	1195	3
Future Volume (veh/h)	2	0	1	36	1	4	0	723	22	35	1195	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1267	1900	1900	1597	1900	1520	1900	1792	1743	1387	1827	1429
Adj Flow Rate, veh/h	2	0	1	45	1	5	0	904	28	44	1494	4
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	50	0	0	19	0	25	0	6	9	37	4	33
Cap, veh/h	3	0	2	115	71	48	2	3346	1012	51	2694	942
Arrive On Green	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.68	0.68	0.04	0.78	0.78
Sat Flow, veh/h	1206	0	1615	2950	1900	1292	1810	4893	1481	1321	3471	1214
Grp Volume(v), veh/h	2	0	1	45	1	5	0	904	28	44	1494	4
Grp Sat Flow(s),veh/h/ln	1206	0	1615	1475	1900	1292	1810	1631	1481	1321	1736	1214
Q Serve(g_s), s	0.1	0.0	0.1	1.2	0.0	0.3	0.0	6.0	0.5	2.8	14.1	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	1.2	0.0	0.3	0.0	6.0	0.5	2.8	14.1	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	0	2	115	71	48	2	3346	1012	51	2694	942
V/C Ratio(X)	0.61	0.00	0.45	0.39	0.01	0.10	0.00	0.27	0.03	0.87	0.55	0.00
Avail Cap(c_a), veh/h	434	0	776	1062	912	620	652	3525	1067	951	3751	1311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.5	0.0	41.6	39.1	38.6	38.7	0.0	5.1	4.2	39.8	3.7	2.1
Incr Delay (d2), s/veh	113.2	0.0	117.8	2.2	0.1	1.1	0.0	0.1	0.0	32.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.5	0.0	0.1	0.0	2.7	0.2	1.5	6.7	0.0
LnGrp Delay(d),s/veh	154.7	0.0	159.3	41.2	38.7	39.8	0.0	5.2	4.3	72.6	3.9	2.1
LnGrp LOS	F		F	D	D	D		A	A	E	A	A
Approach Vol, veh/h		3			51			932			1542	
Approach Delay, s/veh		156.2			41.1			5.1			5.8	
Approach LOS		F			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	62.8	7.7	5.1	0.0	70.4	4.7	8.1
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	60.0	60.0	30.0	40.0	30.0	90.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	4.8	8.0	3.2	2.1	0.0	16.1	2.1	2.3
Green Ext Time (p_c), s	0.1	38.2	0.1	0.0	0.0	48.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	8	73	693	1052	304
Future Volume (veh/h)	22	8	73	693	1052	304
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1900	1900	1810	1829	1900
Adj Flow Rate, veh/h	29	11	96	912	1384	400
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	5	0	0	5	5	5
Cap, veh/h	121	58	127	2898	2770	797
Arrive On Green	0.04	0.04	0.07	0.84	0.72	0.72
Sat Flow, veh/h	3343	1615	1810	3529	4018	1108
Grp Volume(v), veh/h	29	11	96	912	1195	589
Grp Sat Flow(s),veh/h/ln	1672	1615	1810	1719	1664	1633
Q Serve(g_s), s	0.7	0.6	4.4	4.8	13.3	13.4
Cycle Q Clear(g_c), s	0.7	0.6	4.4	4.8	13.3	13.4
Prop In Lane	1.00	1.00	1.00			0.68
Lane Grp Cap(c), veh/h	121	58	127	2898	2393	1174
V/C Ratio(X)	0.24	0.19	0.75	0.31	0.50	0.50
Avail Cap(c_a), veh/h	1588	767	860	4266	2393	1174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	39.4	38.4	1.4	5.2	5.2
Incr Delay (d2), s/veh	1.0	1.5	8.6	0.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	2.5	2.2	6.0	6.0
LnGrp Delay(d),s/veh	40.5	40.9	47.0	1.5	5.4	5.6
LnGrp LOS	D	D	D	A	A	A
Approach Vol, veh/h	40			1008	1784	
Approach Delay, s/veh	40.6			5.8	5.5	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		7.5	10.4	66.2				76.7
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		40.0	40.0	60.0				104.5
Max Q Clear Time (g_c+I1), s		2.7	6.4	15.4				6.8
Green Ext Time (p_c), s		0.1	0.3	36.5				64.2

Intersection Summary	
HCM 2010 Ctrl Delay	6.1
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	204	202	97	257	140	383	575	80	89	590	146
Future Volume (veh/h)	88	204	202	97	257	140	383	575	80	89	590	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1863	1845	1900	1863	1900	1881	1780	1900	1696	1827	1827
Adj Flow Rate, veh/h	106	246	243	117	310	169	461	693	96	107	711	176
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	6	2	3	0	2	2	1	7	7	12	4	4
Cap, veh/h	134	988	433	150	627	333	631	1111	154	134	1366	416
Arrive On Green	0.08	0.28	0.28	0.08	0.28	0.28	0.18	0.37	0.37	0.08	0.27	0.27
Sat Flow, veh/h	1707	3539	1551	1810	2216	1176	3476	2981	413	1616	4988	1518
Grp Volume(v), veh/h	106	246	243	117	246	233	461	393	396	107	711	176
Grp Sat Flow(s),veh/h/ln	1707	1770	1551	1810	1770	1622	1738	1691	1703	1616	1663	1518
Q Serve(g_s), s	6.3	5.6	13.9	6.6	12.0	12.5	13.0	19.7	19.8	6.8	12.6	9.9
Cycle Q Clear(g_c), s	6.3	5.6	13.9	6.6	12.0	12.5	13.0	19.7	19.8	6.8	12.6	9.9
Prop In Lane	1.00		1.00	1.00		0.72	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	134	988	433	150	501	459	631	630	635	134	1366	416
V/C Ratio(X)	0.79	0.25	0.56	0.78	0.49	0.51	0.73	0.62	0.62	0.80	0.52	0.42
Avail Cap(c_a), veh/h	492	1701	745	783	850	780	1336	630	635	466	2157	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	29.1	32.1	46.8	31.0	31.2	40.2	26.7	26.7	46.9	32.0	31.0
Incr Delay (d2), s/veh	9.8	0.5	4.1	8.5	1.1	1.2	3.5	3.9	3.9	10.4	0.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	2.8	6.4	3.7	6.0	5.7	6.6	9.8	9.9	3.4	5.8	4.2
LnGrp Delay(d),s/veh	56.9	29.5	36.2	55.3	32.1	32.5	43.7	30.5	30.5	57.3	32.4	32.0
LnGrp LOS	E	C	D	E	C	C	D	C	C	E	C	C
Approach Vol, veh/h		595			596			1250			994	
Approach Delay, s/veh		37.1			36.8			35.4			35.0	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	43.8	12.6	35.0	22.9	33.5	12.2	35.5
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	30.0	45.0	50.0	40.0	45.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	8.8	21.8	8.6	15.9	15.0	14.6	8.3	14.5
Green Ext Time (p_c), s	0.3	7.2	0.3	12.8	3.9	13.9	0.2	13.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	21	71	20	67	31	92	349	62	30	336	40
Future Volume (veh/h)	30	21	71	20	67	31	92	349	62	30	336	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1516	1484	1900	1721	1792	1712	1741	1900	1387	1776	1727
Adj Flow Rate, veh/h	33	23	78	22	74	34	101	384	68	33	369	44
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	33	33	28	9	9	6	11	7	7	37	7	10
Cap, veh/h	142	64	272	98	225	328	129	713	126	47	800	647
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.08	0.49	0.49	0.04	0.45	0.45
Sat Flow, veh/h	175	299	1259	82	1043	1520	1630	1441	255	1321	1776	1436
Grp Volume(v), veh/h	56	0	78	96	0	34	101	0	452	33	369	44
Grp Sat Flow(s),veh/h/ln	474	0	1259	1125	0	1520	1630	0	1696	1321	1776	1436
Q Serve(g_s), s	0.7	0.0	2.9	0.3	0.0	1.0	3.3	0.0	10.1	1.4	7.9	1.0
Cycle Q Clear(g_c), s	9.6	0.0	2.9	9.4	0.0	1.0	3.3	0.0	10.1	1.4	7.9	1.0
Prop In Lane	0.59		1.00	0.23		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	206	0	272	323	0	328	129	0	839	47	800	647
V/C Ratio(X)	0.27	0.00	0.29	0.30	0.00	0.10	0.78	0.00	0.54	0.70	0.46	0.07
Avail Cap(c_a), veh/h	599	0	686	837	0	828	888	0	1232	720	1612	1304
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	18.1	18.1	0.0	17.3	24.9	0.0	9.6	26.3	10.5	8.6
Incr Delay (d2), s/veh	0.8	0.0	0.7	0.6	0.0	0.2	11.3	0.0	1.5	20.0	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	1.0	1.3	0.0	0.4	1.9	0.0	5.0	0.8	4.0	0.4
LnGrp Delay(d),s/veh	20.0	0.0	18.7	18.7	0.0	17.5	36.1	0.0	11.1	46.3	11.6	8.7
LnGrp LOS	B		B	B		B	D		B	D	B	A
Approach Vol, veh/h		134			130			553			446	
Approach Delay, s/veh		19.2			18.4			15.7			13.9	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	32.8		16.8	8.5	30.3		16.8
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	30.0	40.0		30.0	30.0	50.0		30.0
Max Q Clear Time (g_c+I1), s	3.4	12.1		11.6	5.3	9.9		11.4
Green Ext Time (p_c), s	0.1	12.7		1.3	0.3	15.1		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	103	75	388	125	85	45	432	531	140	411	16
Future Volume (veh/h)	27	103	75	388	125	85	45	432	531	140	411	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1881	1900	1845	1836	1863	1863	1792	1863	1827	1780	1900
Adj Flow Rate, veh/h	30	114	83	285	343	94	50	480	590	156	457	18
Adj No. of Lanes	1	2	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	1	3	4	2	2	6	2	4	7	7
Cap, veh/h	147	194	130	391	409	350	65	1457	676	186	1650	65
Arrive On Green	0.10	0.10	0.10	0.22	0.22	0.22	0.04	0.43	0.43	0.11	0.50	0.50
Sat Flow, veh/h	1547	2036	1365	1757	1836	1573	1774	3406	1581	1740	3314	130
Grp Volume(v), veh/h	30	99	98	285	343	94	50	480	590	156	233	242
Grp Sat Flow(s),veh/h/ln	1547	1787	1615	1757	1836	1573	1774	1703	1581	1740	1691	1754
Q Serve(g_s), s	2.2	6.6	7.3	18.9	22.4	6.2	3.5	11.8	42.7	11.0	10.0	10.1
Cycle Q Clear(g_c), s	2.2	6.6	7.3	18.9	22.4	6.2	3.5	11.8	42.7	11.0	10.0	10.1
Prop In Lane	1.00		0.85	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	147	170	154	391	409	350	65	1457	676	186	842	873
V/C Ratio(X)	0.20	0.58	0.64	0.73	0.84	0.27	0.77	0.33	0.87	0.84	0.28	0.28
Avail Cap(c_a), veh/h	346	399	361	841	879	753	283	1630	757	486	842	873
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	54.3	54.6	45.2	46.6	40.3	59.8	23.9	32.7	54.9	18.3	18.3
Incr Delay (d2), s/veh	0.7	3.1	4.4	2.6	4.6	0.4	17.1	0.2	10.6	9.7	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.4	3.5	9.5	11.9	2.7	2.0	5.6	20.5	5.8	4.7	4.9
LnGrp Delay(d),s/veh	53.0	57.4	59.0	47.8	51.2	40.7	77.0	24.1	43.4	64.7	18.6	18.6
LnGrp LOS	D	E	E	D	D	D	E	C	D	E	B	B
Approach Vol, veh/h		227			722			1120			631	
Approach Delay, s/veh		57.5			48.5			36.6			30.0	
Approach LOS		E			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	17.4	58.6		16.9	8.6	67.4		32.4
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	35.0	60.0		28.0	20.0	60.0		60.0
Max Q Clear Time (g_c+I1), s	13.0	44.7		9.3	5.5	12.1		24.4
Green Ext Time (p_c), s	0.4	8.9		1.1	0.1	18.5		3.5

Intersection Summary	
HCM 2010 Ctrl Delay	40.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	749	13	17	604	525	12	16	6	257	11	93
Future Volume (veh/h)	135	749	13	17	604	525	12	16	6	257	11	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1882	1900	1792	1863	1827	1900	1675	1900	1759	1770	1776
Adj Flow Rate, veh/h	155	861	15	20	694	0	14	18	7	304	0	107
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	1	1	6	2	4	0	12	12	8	0	7
Cap, veh/h	182	1434	25	28	1105	485	527	334	130	441	0	197
Arrive On Green	0.10	0.40	0.40	0.02	0.31	0.00	0.29	0.29	0.29	0.13	0.00	0.13
Sat Flow, veh/h	1774	3595	63	1707	3539	1553	1810	1148	446	3351	0	1496
Grp Volume(v), veh/h	155	428	448	20	694	0	14	0	25	304	0	107
Grp Sat Flow(s),veh/h/ln	1774	1787	1870	1707	1770	1553	1810	0	1595	1675	0	1496
Q Serve(g_s), s	10.3	22.8	22.8	1.4	20.2	0.0	0.7	0.0	1.4	10.4	0.0	8.0
Cycle Q Clear(g_c), s	10.3	22.8	22.8	1.4	20.2	0.0	0.7	0.0	1.4	10.4	0.0	8.0
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	182	713	746	28	1105	485	527	0	464	441	0	197
V/C Ratio(X)	0.85	0.60	0.60	0.72	0.63	0.00	0.03	0.00	0.05	0.69	0.00	0.54
Avail Cap(c_a), veh/h	229	713	746	291	1325	581	527	0	464	975	0	435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.0	28.6	28.6	58.9	35.4	0.0	30.5	0.0	30.7	49.9	0.0	48.8
Incr Delay (d2), s/veh	21.0	3.1	3.0	29.6	2.2	0.0	0.1	0.0	0.2	2.7	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	11.8	12.3	0.9	10.2	0.0	0.3	0.0	0.6	5.0	0.0	3.5
LnGrp Delay(d),s/veh	74.0	31.7	31.5	88.5	37.5	0.0	30.5	0.0	30.9	52.6	0.0	52.1
LnGrp LOS	E	C	C	F	D		C		C	D		D
Approach Vol, veh/h		1031			714			39			411	
Approach Delay, s/veh		38.0			39.0			30.8			52.5	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.0	6.4	53.0		20.8	16.9	42.5
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		35.0	20.5	45.0		35.0	15.5	45.0
Max Q Clear Time (g_c+I1), s		3.4	3.4	24.8		12.4	12.3	22.2
Green Ext Time (p_c), s		0.2	0.0	17.3		2.3	0.1	15.4

Intersection Summary	
HCM 2010 Ctrl Delay	40.9
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	653	429	352	1004	0	0	0	0	45	0	211
Future Volume (veh/h)	0	653	429	352	1004	0	0	0	0	45	0	211
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1810	1881	1845	0				1827	1827	1900
Adj Flow Rate, veh/h	0	734	482	396	1128	0				51	0	237
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	5	1	3	0				4	0	4
Cap, veh/h	0	1436	623	433	2499	0				313	0	280
Arrive On Green	0.00	0.41	0.41	0.24	0.71	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3632	1535	1792	3597	0				1740	0	1553
Grp Volume(v), veh/h	0	734	482	396	1128	0				51	0	237
Grp Sat Flow(s),veh/h/ln	0	1770	1535	1792	1752	0				1740	0	1553
Q Serve(g_s), s	0.0	13.4	23.4	18.5	11.7	0.0				2.1	0.0	12.7
Cycle Q Clear(g_c), s	0.0	13.4	23.4	18.5	11.7	0.0				2.1	0.0	12.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1436	623	433	2499	0				313	0	280
V/C Ratio(X)	0.00	0.51	0.77	0.91	0.45	0.00				0.16	0.00	0.85
Avail Cap(c_a), veh/h	0	1436	623	521	2499	0				526	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.76	0.76	0.49	0.49	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.2	22.1	31.7	5.2	0.0				29.8	0.0	34.1
Incr Delay (d2), s/veh	0.0	1.0	7.0	9.7	0.3	0.0				0.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	11.1	10.3	5.6	0.0				1.0	0.0	5.7
LnGrp Delay(d),s/veh	0.0	20.1	29.2	41.4	5.5	0.0				29.9	0.0	37.2
LnGrp LOS		C	C	D	A					C		D
Approach Vol, veh/h		1216			1524						288	
Approach Delay, s/veh		23.7			14.8						35.9	
Approach LOS		C			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	26.4	40.0		19.6		66.4		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	25.0	20.4		26.0		51.0		
Max Q Clear Time (g_c+I1), s	20.5	25.4		14.7		13.7		
Green Ext Time (p_c), s	0.3	0.0		0.8		14.7		

Intersection Summary	
HCM 2010 Ctrl Delay	20.4
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	522	0	0	733	54	623	2	834	0	0	0
Future Volume (veh/h)	176	522	0	0	733	54	623	2	834	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1863	0	0	1863	1900	1845	1873	1881			
Adj Flow Rate, veh/h	196	580	0	0	814	60	1018	0	580			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	2	0	0	2	2	3	0	1			
Cap, veh/h	232	1844	0	0	1167	86	1331	0	606			
Arrive On Green	0.13	0.52	0.00	0.00	0.35	0.35	0.38	0.00	0.38			
Sat Flow, veh/h	1757	3632	0	0	3436	246	3514	0	1599			
Grp Volume(v), veh/h	196	580	0	0	431	443	1018	0	580			
Grp Sat Flow(s),veh/h/ln	1757	1770	0	0	1770	1819	1757	0	1599			
Q Serve(g_s), s	9.5	8.2	0.0	0.0	18.2	18.2	22.0	0.0	30.8			
Cycle Q Clear(g_c), s	9.5	8.2	0.0	0.0	18.2	18.2	22.0	0.0	30.8			
Prop In Lane	1.00		0.00	0.00		0.14	1.00		1.00			
Lane Grp Cap(c), veh/h	232	1844	0	0	618	635	1331	0	606			
V/C Ratio(X)	0.85	0.31	0.00	0.00	0.70	0.70	0.76	0.00	0.96			
Avail Cap(c_a), veh/h	303	1844	0	0	618	635	1333	0	607			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	0.92	0.92	1.00	0.00	1.00			
Uniform Delay (d), s/veh	36.9	11.9	0.0	0.0	24.4	24.4	23.6	0.0	26.3			
Incr Delay (d2), s/veh	11.2	0.4	0.0	0.0	6.0	5.8	2.9	0.0	26.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.3	4.0	0.0	0.0	9.9	10.1	11.1	0.0	18.0			
LnGrp Delay(d),s/veh	48.1	12.3	0.0	0.0	30.3	30.2	26.5	0.0	52.7			
LnGrp LOS	D	B			C	C	C		D			
Approach Vol, veh/h		776			874			1598				
Approach Delay, s/veh		21.3			30.2			36.0				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		49.9			15.0	35.0		37.1
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		45.0			15.0	26.5		33.0
Max Q Clear Time (g_c+I1), s		10.2			11.5	20.2		32.8
Green Ext Time (p_c), s		7.7			0.1	3.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1261	61	11	646	0	140	0	26	0	0	0
Future Volume (veh/h)	49	1261	61	11	646	0	140	0	26	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1873	1900	1583	1863	0	1845	0	1638			
Adj Flow Rate, veh/h	56	1449	70	13	743	0	161	0	30			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Percent Heavy Veh, %	0	1	1	20	2	0	3	0	16			
Cap, veh/h	101	2358	114	19	2265	0	211	0	167			
Arrive On Green	0.06	0.68	0.68	0.01	0.64	0.00	0.12	0.00	0.12			
Sat Flow, veh/h	1810	3453	166	1508	3632	0	1757	0	1392			
Grp Volume(v), veh/h	56	745	774	13	743	0	161	0	30			
Grp Sat Flow(s),veh/h/ln	1810	1780	1839	1508	1770	0	1757	0	1392			
Q Serve(g_s), s	2.2	16.7	16.9	0.6	7.0	0.0	6.5	0.0	1.4			
Cycle Q Clear(g_c), s	2.2	16.7	16.9	0.6	7.0	0.0	6.5	0.0	1.4			
Prop In Lane	1.00		0.09	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	101	1216	1256	19	2265	0	211	0	167			
V/C Ratio(X)	0.56	0.61	0.62	0.68	0.33	0.00	0.76	0.00	0.18			
Avail Cap(c_a), veh/h	618	1216	1256	515	2416	0	600	0	475			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.7	6.3	6.4	36.0	6.0	0.0	31.2	0.0	29.0			
Incr Delay (d2), s/veh	4.7	1.6	1.6	34.7	0.2	0.0	5.7	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	8.6	8.9	0.4	3.5	0.0	3.5	0.0	0.6			
LnGrp Delay(d),s/veh	38.4	7.9	7.9	70.7	6.2	0.0	36.9	0.0	29.5			
LnGrp LOS	D	A	A	E	A		D		C			
Approach Vol, veh/h		1575			756			191				
Approach Delay, s/veh		9.0			7.3			35.7				
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.9	55.0			8.1	51.9		13.3
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	25.0	50.0			25.0	50.0		25.0
Max Q Clear Time (g_c+I1), s	2.6	18.9			4.2	9.0		8.5
Green Ext Time (p_c), s	0.0	29.3			0.1	37.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	572	979	4
Future Vol, veh/h	0	0	16	572	979	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	602	1031	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	518	1035	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	508	679	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	508	679	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	679	-	-	-	-
HCM Lane V/C Ratio	0.025	-	-	-	-
HCM Control Delay (s)	10.4	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	49	45	65	152	234	79
Future Vol, veh/h	49	45	65	152	234	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	49	71	165	254	86

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	521	170	340	0	-	0
Stage 1	297	-	-	-	-	-
Stage 2	224	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	485	844	1216	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	457	844	1216	-	-	-
Mov Cap-2 Maneuver	457	-	-	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1216	-	457	844	-	-
HCM Lane V/C Ratio	0.058	-	0.117	0.058	-	-
HCM Control Delay (s)	8.1	-	13.9	9.5	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	524	695	39	13	399	135	151	13	18	12	4	63
Future Volume (veh/h)	524	695	39	13	399	135	151	13	18	12	4	63
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	570	755	42	14	434	147	164	14	20	13	4	68
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	599	1296	72	422	759	255	210	82	117	81	25	94
Arrive On Green	0.34	0.38	0.38	0.24	0.29	0.29	0.12	0.12	0.12	0.06	0.06	0.06
Sat Flow, veh/h	1774	3409	190	1774	2604	874	1774	695	993	1372	422	1583
Grp Volume(v), veh/h	570	392	405	14	294	287	164	0	34	17	0	68
Grp Sat Flow(s),veh/h/ln	1774	1770	1829	1774	1770	1709	1774	0	1688	1794	0	1583
Q Serve(g_s), s	27.6	15.5	15.5	0.5	12.4	12.6	7.9	0.0	1.6	0.8	0.0	3.7
Cycle Q Clear(g_c), s	27.6	15.5	15.5	0.5	12.4	12.6	7.9	0.0	1.6	0.8	0.0	3.7
Prop In Lane	1.00		0.10	1.00		0.51	1.00		0.59	0.76		1.00
Lane Grp Cap(c), veh/h	599	673	695	422	516	498	210	0	200	106	0	94
V/C Ratio(X)	0.95	0.58	0.58	0.03	0.57	0.58	0.78	0.00	0.17	0.16	0.00	0.72
Avail Cap(c_a), veh/h	605	1207	1248	605	1207	1166	605	0	576	612	0	540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	21.7	21.7	25.8	26.5	26.5	37.7	0.0	34.9	39.3	0.0	40.7
Incr Delay (d2), s/veh	25.0	2.9	2.8	0.0	3.6	3.8	6.2	0.0	0.4	0.7	0.0	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.6	8.0	8.3	0.3	6.5	6.4	4.2	0.0	0.8	0.4	0.0	1.9
LnGrp Delay(d),s/veh	53.5	24.6	24.5	25.8	30.0	30.3	43.9	0.0	35.3	40.0	0.0	50.7
LnGrp LOS	D	C	C	C	C	C	D		D	D		D
Approach Vol, veh/h		1367			595			198			85	
Approach Delay, s/veh		36.6			30.1			42.4			48.6	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.9	38.4		14.4	33.7	30.6		9.2
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	30.0	* 60		30.0	30.0	60.0		30.0
Max Q Clear Time (g_c+I1), s	2.5	17.5		9.9	29.6	14.6		5.7
Green Ext Time (p_c), s	9.2	15.9		0.6	0.1	11.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	35.8
HCM 2010 LOS	D

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	153	54	534	155	54	925
Future Volume (veh/h)	153	54	534	155	54	925
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	166	59	580	168	59	1005
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	383	176	2569	976	105	2380
Arrive On Green	0.11	0.11	0.51	0.51	0.06	0.67
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	166	59	580	168	59	1005
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	1.9	1.4	2.7	1.9	1.3	5.4
Cycle Q Clear(g_c), s	1.9	1.4	2.7	1.9	1.3	5.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	383	176	2569	976	105	2380
V/C Ratio(X)	0.43	0.34	0.23	0.17	0.56	0.42
Avail Cap(c_a), veh/h	1488	685	2569	976	234	2380
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	17.1	5.8	3.4	19.0	3.1
Incr Delay (d2), s/veh	0.8	1.1	0.2	0.4	4.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.7	1.3	1.2	0.8	2.7
LnGrp Delay(d),s/veh	18.1	18.2	6.0	3.8	23.6	3.7
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	225		748			1064
Approach Delay, s/veh	18.1		5.5			4.8
Approach LOS	B		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.0	25.5				32.5		9.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	5.5	18.0				28.0		18.0
Max Q Clear Time (g_c+I1), s	3.3	4.7				7.4		3.9
Green Ext Time (p_c), s	0.0	9.0				12.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	177	0	0	197	0	0
Future Vol, veh/h	177	0	0	197	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	0	0	214	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	192
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	850
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	850
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Intersection Delay, s/veh	23
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	250	494	145	228	0	213	0	46	1	0	1
Future Vol, veh/h	0	250	494	145	228	0	213	0	46	1	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	13	5	7	13	0	9	0	4	0	0	0
Mvmt Flow	0	278	549	161	253	0	237	0	51	1	0	1
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	28.6	15.4	18	11.3
HCM LOS	D	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	50%
Vol Thru, %	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	100%	0%	100%	0%	0%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	213	46	250	494	145	228	2
LT Vol	213	0	0	0	145	0	1
Through Vol	0	0	250	0	0	228	0
RT Vol	0	46	0	494	0	0	1
Lane Flow Rate	237	51	278	549	161	253	2
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.53	0.095	0.506	0.87	0.331	0.492	0.005
Departure Headway (Hd)	8.068	6.686	6.553	5.703	7.394	6.988	8.221
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	445	533	547	631	483	512	438
Service Time	5.848	4.465	4.328	3.477	5.182	4.775	6.221
HCM Lane V/C Ratio	0.533	0.096	0.508	0.87	0.333	0.494	0.005
HCM Control Delay	19.7	10.2	15.9	35.1	13.8	16.4	11.3
HCM Lane LOS	C	B	C	E	B	C	B
HCM 95th-tile Q	3	0.3	2.8	10.1	1.4	2.7	0

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	74	298	4	98	784
Future Vol, veh/h	2	74	298	4	98	784
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	9	0	1	3
Mvmt Flow	2	81	327	4	108	862

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1407	330	0	0	332	0
Stage 1	330	-	-	-	-	-
Stage 2	1077	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	155	716	-	-	1233	-
Stage 1	733	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	141	716	-	-	1233	-
Mov Cap-2 Maneuver	141	-	-	-	-	-
Stage 1	733	-	-	-	-	-
Stage 2	301	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	647	1233	-
HCM Lane V/C Ratio	-	-	0.129	0.087	-
HCM Control Delay (s)	-	-	11.4	8.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.3	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	34	2	3	2	298	26	3	795	2
Future Vol, veh/h	1	1	1	34	2	3	2	298	26	3	795	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	1	1	1	40	2	4	2	351	31	4	935	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1300	1299	936	1299	1300	351	938	0	0	351	0	0
Stage 1	944	944	-	355	355	-	-	-	-	-	-	-
Stage 2	356	355	-	944	945	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	140	163	324	140	163	697	739	-	-	1219	-	-
Stage 1	317	344	-	666	633	-	-	-	-	-	-	-
Stage 2	666	633	-	317	343	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	137	162	324	138	162	697	739	-	-	1219	-	-
Mov Cap-2 Maneuver	137	162	-	138	162	-	-	-	-	-	-	-
Stage 1	316	343	-	664	631	-	-	-	-	-	-	-
Stage 2	658	631	-	314	342	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.2	39.5	0.1	0
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	739	-	-	148	324	139	697	1219	-	-
HCM Lane V/C Ratio	0.003	-	-	0.016	0.004	0.305	0.005	0.003	-	-
HCM Control Delay (s)	9.9	-	-	29.7	16.2	41.9	10.2	8	-	-
HCM Lane LOS	A	-	-	D	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	1.2	0	0	-	-

Intersection	
Intersection Delay, s/veh	21.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	22	180	103	26	10	81	157	24	5	280	99
Future Vol, veh/h	97	22	180	103	26	10	81	157	24	5	280	99
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	4	9	6	0	0	0	5	8	4	0	3	8
Mvmt Flow	120	27	222	127	32	12	100	194	30	6	346	122
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	17.1	19	18.5	27.9
HCM LOS	C	C	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	82%	0%	74%	100%	0%	0%
Vol Thru, %	0%	87%	18%	0%	19%	0%	100%	0%
Vol Right, %	0%	13%	0%	100%	7%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	181	119	180	139	5	280	99
LT Vol	81	0	97	0	103	5	0	0
Through Vol	0	157	22	0	26	0	280	0
RT Vol	0	24	0	180	10	0	0	99
Lane Flow Rate	100	223	147	222	172	6	346	122
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.251	0.525	0.36	0.48	0.439	0.015	0.775	0.252
Departure Headway (Hd)	9.029	8.466	8.829	7.78	9.205	8.529	8.067	7.434
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	398	427	408	464	391	420	449	484
Service Time	6.777	6.214	6.575	5.525	6.955	6.269	5.807	5.174
HCM Lane V/C Ratio	0.251	0.522	0.36	0.478	0.44	0.014	0.771	0.252
HCM Control Delay	14.8	20.2	16.5	17.5	19	11.4	33.6	12.7
HCM Lane LOS	B	C	C	C	C	B	D	B
HCM 95th-tile Q	1	3	1.6	2.6	2.2	0	6.7	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	17	272	581	0
Future Vol, veh/h	0	9	17	272	581	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	6	5	0
Mvmt Flow	0	12	23	368	785	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1199	785	785	0	-	0
Stage 1	785	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	207	396	843	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	396	843	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	843	-	396	-	-
HCM Lane V/C Ratio	0.027	-	0.031	-	-
HCM Control Delay (s)	9.4	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	46.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	79	114	175	109	242	348
Future Vol, veh/h	79	114	175	109	242	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	0	0	4	2	5	4
Mvmt Flow	111	161	246	154	341	490

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1495	323	0	0	400	0
Stage 1	323	-	-	-	-	-
Stage 2	1172	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	137	723	-	-	1143	-
Stage 1	738	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 96	723	-	-	1143	-
Mov Cap-2 Maneuver	~ 96	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	208	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	245.3	0	3.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	197	1143	-
HCM Lane V/C Ratio	-	-	1.38	0.298	-
HCM Control Delay (s)	-	-	245.3	9.5	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	15.8	1.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	67	237	113	150	331
Future Vol, veh/h	30	67	237	113	150	331
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	0	0	3	1	0	2
Mvmt Flow	50	112	395	188	250	552

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1541	489	0	0	583	0
Stage 1	489	-	-	-	-	-
Stage 2	1052	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	128	583	-	-	1001	-
Stage 1	621	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	583	-	-	1001	-
Mov Cap-2 Maneuver	96	-	-	-	-	-
Stage 1	621	-	-	-	-	-
Stage 2	254	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.7	0	3.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	96	583	1001	-
HCM Lane V/C Ratio	-	-	0.521	0.192	0.25	-
HCM Control Delay (s)	-	-	77.6	12.6	9.8	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.7	1	-

Intersection	
Int Delay, s/veh	65.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	127	0	103	3	247	129	109	248	4
Future Vol, veh/h	0	0	3	127	0	103	3	247	129	109	248	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	2	0
Mvmt Flow	0	0	4	187	0	151	4	363	190	160	365	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1231	1250	368	1157	1158	458	371	0	0	553	0	0
Stage 1	688	688	-	467	467	-	-	-	-	-	-	-
Stage 2	543	562	-	690	691	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	156	174	682	~ 175	198	607	1199	-	-	1027	-	-
Stage 1	440	450	-	580	565	-	-	-	-	-	-	-
Stage 2	528	513	-	439	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	103	146	682	~ 153	167	607	1199	-	-	1027	-	-
Mov Cap-2 Maneuver	103	146	-	~ 153	167	-	-	-	-	-	-	-
Stage 1	439	380	-	578	563	-	-	-	-	-	-	-
Stage 2	395	511	-	368	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	273.4	0.1	2.8
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1199	-	-	682	230	1027	-	-
HCM Lane V/C Ratio	0.004	-	-	0.006	1.471	0.156	-	-
HCM Control Delay (s)	8	-	-	10.3	273.4	9.2	-	-
HCM Lane LOS	A	-	-	B	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	19.9	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	8.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	161	60	319	304	111	267
Future Vol, veh/h	161	60	319	304	111	267
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	3	1	1	2
Mvmt Flow	218	81	431	411	150	361

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1297	636	0	0	842	0
Stage 1	636	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	~ 180	481	-	-	798	-
Stage 1	531	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 146	481	-	-	798	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	531	-	-	-	-	-
Stage 2	420	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.6	0	3.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	279	481	798	-
HCM Lane V/C Ratio	-	-	0.78	0.169	0.188	-
HCM Control Delay (s)	-	-	51.9	14	10.6	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	6	0.6	0.7	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	38	56	604	448	0
Future Vol, veh/h	1	38	56	604	448	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	19	9	3	3	0
Mvmt Flow	1	51	76	816	605	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1573	605	605	0	-	0
Stage 1	605	-	-	-	-	-
Stage 2	968	-	-	-	-	-
Critical Hdwy	6.4	6.39	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.471	2.281	-	-	-
Pot Cap-1 Maneuver	123	468	940	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	113	468	940	-	-	-
Mov Cap-2 Maneuver	240	-	-	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	342	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	940	-	457	-	-
HCM Lane V/C Ratio	0.081	-	0.115	-	-
HCM Control Delay (s)	9.2	-	13.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	184	1	1	15	128	684	5	22	600	20
Future Vol, veh/h	0	0	184	1	1	15	128	684	5	22	600	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	7	3	4	0	0	6	20
Mvmt Flow	0	0	194	1	1	16	135	720	5	23	632	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	632	1670	1670	723	632	0	0	725	0	0
Stage 1	-	-	-	992	992	-	-	-	-	-	-	-
Stage 2	-	-	-	678	678	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.1	6.5	6.27	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.5	4	3.363	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	480	77	97	418	946	-	-	887	-	-
Stage 1	0	0	-	299	326	-	-	-	-	-	-	-
Stage 2	0	0	-	445	455	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	480	40	81	418	946	-	-	887	-	-
Mov Cap-2 Maneuver	-	-	-	40	81	-	-	-	-	-	-	-
Stage 1	-	-	-	256	279	-	-	-	-	-	-	-
Stage 2	-	-	-	259	443	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	21.8	1.5	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	946	-	-	480	232	887	-	-
HCM Lane V/C Ratio	0.142	-	-	0.404	0.077	0.026	-	-
HCM Control Delay (s)	9.4	-	-	17.5	21.8	9.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.9	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	177	1	3	195	5	4
Future Vol, veh/h	177	1	3	195	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	1	3	212	5	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	193	0	411	193
Stage 1	-	-	-	-	193	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1380	-	597	849
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1380	-	596	849
Mov Cap-2 Maneuver	-	-	-	-	650	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	726	-	-	1380	-
HCM Lane V/C Ratio	0.013	-	-	0.002	-
HCM Control Delay (s)	10	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	118	349	116	99	49	290	335	150	48	272	81
Future Volume (veh/h)	59	118	349	116	99	49	290	335	150	48	272	81
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1845	1827	1815	1900	1759	1845	1845	1863	1825	1900
Adj Flow Rate, veh/h	66	133	392	130	111	55	326	376	169	54	306	91
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	4	3	4	6	6	8	3	3	2	5	5
Cap, veh/h	477	505	425	243	159	79	362	662	554	70	463	134
Arrive On Green	0.28	0.28	0.28	0.14	0.14	0.14	0.22	0.36	0.36	0.04	0.18	0.18
Sat Flow, veh/h	1723	1827	1535	1740	1139	565	1675	1845	1544	1774	2616	760
Grp Volume(v), veh/h	66	133	392	130	0	166	326	376	169	54	200	197
Grp Sat Flow(s),veh/h/ln	1723	1827	1535	1740	0	1704	1675	1845	1544	1774	1734	1642
Q Serve(g_s), s	2.7	5.3	23.4	6.5	0.0	8.7	17.8	15.5	7.4	2.8	10.1	10.5
Cycle Q Clear(g_c), s	2.7	5.3	23.4	6.5	0.0	8.7	17.8	15.5	7.4	2.8	10.1	10.5
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	477	505	425	243	0	238	362	662	554	70	307	291
V/C Ratio(X)	0.14	0.26	0.92	0.54	0.00	0.70	0.90	0.57	0.31	0.78	0.65	0.68
Avail Cap(c_a), veh/h	512	543	456	517	0	506	445	783	656	480	736	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	26.6	33.1	37.7	0.0	38.6	36.0	24.3	21.7	44.8	36.1	36.2
Incr Delay (d2), s/veh	0.0	0.1	22.8	0.7	0.0	1.4	18.7	0.3	0.1	6.7	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.7	12.6	3.2	0.0	4.2	10.1	7.9	3.2	1.5	4.9	4.9
LnGrp Delay(d),s/veh	25.7	26.7	55.9	38.4	0.0	40.0	54.6	24.6	21.9	51.5	37.0	37.3
LnGrp LOS	C	C	E	D		D	D	C	C	D	D	D
Approach Vol, veh/h		591			296			871			451	
Approach Delay, s/veh		45.9			39.3			35.3			38.8	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.7	39.3		30.1	24.8	22.2		17.1
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	25.5	40.0		28.0	25.0	40.0		28.0
Max Q Clear Time (g_c+I1), s	4.8	17.5		25.4	19.8	12.5		10.7
Green Ext Time (p_c), s	0.0	3.5		0.5	0.5	3.6		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	39.4
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	27	16	71	14	450	22	459	80	388	478	12
Future Volume (veh/h)	11	27	16	71	14	450	22	459	80	388	478	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1839	1845	1900	1845	1827	1863	1864	1900
Adj Flow Rate, veh/h	12	29	17	76	15	479	23	488	85	413	509	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	3	0	3	4	2	2	2
Cap, veh/h	113	244	122	396	70	768	28	619	515	411	998	25
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.02	0.34	0.34	0.23	0.55	0.55
Sat Flow, veh/h	193	944	471	1162	270	1562	1810	1845	1534	1774	1808	46
Grp Volume(v), veh/h	58	0	0	91	0	479	23	488	85	413	0	522
Grp Sat Flow(s),veh/h/ln	1608	0	0	1432	0	1562	1810	1845	1534	1774	0	1854
Q Serve(g_s), s	0.0	0.0	0.0	1.4	0.0	15.6	0.9	16.5	2.7	16.0	0.0	12.1
Cycle Q Clear(g_c), s	1.7	0.0	0.0	3.1	0.0	15.6	0.9	16.5	2.7	16.0	0.0	12.1
Prop In Lane	0.21		0.29	0.84		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	479	0	0	466	0	768	28	619	515	411	0	1023
V/C Ratio(X)	0.12	0.00	0.00	0.20	0.00	0.62	0.82	0.79	0.17	1.00	0.00	0.51
Avail Cap(c_a), veh/h	525	0	0	479	0	782	419	962	800	411	0	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.6	0.0	0.0	20.0	0.0	12.9	33.9	20.7	16.1	26.5	0.0	9.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	1.5	19.0	2.4	0.1	45.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.4	0.0	7.0	0.6	8.8	1.2	13.0	0.0	6.2
LnGrp Delay(d),s/veh	19.7	0.0	0.0	20.2	0.0	14.4	52.9	23.1	16.3	72.1	0.0	10.1
LnGrp LOS	B			C		B	D	C	B	F		B
Approach Vol, veh/h		58			570			596			935	
Approach Delay, s/veh		19.7			15.4			23.3			37.5	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	27.2		21.9	5.1	42.1		21.9
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	36.0		20.0	16.0	36.0		18.5
Max Q Clear Time (g_c+I1), s	18.0	18.5		3.7	2.9	14.1		17.6
Green Ext Time (p_c), s	0.0	4.7		2.5	0.0	7.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	27.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Future Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1869	1900	1881	1876	1900	1827	1853	1900	1900	1845	1863
Adj Flow Rate, veh/h	63	52	81	112	37	64	112	472	134	49	203	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	0	0	4	3	3	0	3	2
Cap, veh/h	136	112	220	250	86	149	158	816	230	96	486	417
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.09	0.30	0.30	0.05	0.26	0.00
Sat Flow, veh/h	997	823	1615	1792	618	1069	1740	2713	765	1810	1845	1583
Grp Volume(v), veh/h	115	0	81	112	0	101	112	305	301	49	203	0
Grp Sat Flow(s),veh/h/ln	1819	0	1615	1792	0	1688	1740	1760	1718	1810	1845	1583
Q Serve(g_s), s	2.3	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Cycle Q Clear(g_c), s	2.3	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Prop In Lane	0.55		1.00	1.00		0.63	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	248	0	220	250	0	235	158	529	517	96	486	417
V/C Ratio(X)	0.46	0.00	0.37	0.45	0.00	0.43	0.71	0.58	0.58	0.51	0.42	0.00
Avail Cap(c_a), veh/h	1413	0	1255	1160	0	1092	901	1823	1779	937	1911	1640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.4	0.0	15.2	15.2	0.0	15.2	17.1	11.4	11.4	17.8	11.8	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.4	0.5	0.0	0.5	2.2	0.5	0.6	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.8	1.1	0.0	1.0	1.2	2.8	2.8	0.5	1.8	0.0
LnGrp Delay(d),s/veh	15.9	0.0	15.5	15.7	0.0	15.7	19.3	12.0	12.0	19.4	12.1	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		196			213			718			252	
Approach Delay, s/veh		15.7			15.7			13.1			13.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	15.3		8.8	6.5	13.9		9.5
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		25.0
Max Q Clear Time (g_c+I1), s	3.0	7.7		4.3	4.4	5.5		4.2
Green Ext Time (p_c), s	0.0	3.9		0.5	0.1	3.9		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	30.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	122	426	249	88	123	249
Future Vol, veh/h	122	426	249	88	123	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	3	3	2	4	1
Mvmt Flow	131	458	268	95	132	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	800	268	0	0	268	0
Stage 1	268	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.41	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	356	768	-	-	1284	-
Stage 1	779	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	313	768	-	-	1284	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.2	0	2.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	580	1284	-
HCM Lane V/C Ratio	-	-	1.016	0.103	-
HCM Control Delay (s)	-	-	68.2	8.1	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	15.5	0.3	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	31	51	131	43	82
Future Vol, veh/h	122	31	51	131	43	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	6	5	4
Mvmt Flow	133	34	55	142	47	89

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	166	0	402	149
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	253	-
Critical Hdwy	-	-	4.12	-	6.45	6.24
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.336
Pot Cap-1 Maneuver	-	-	1412	-	598	892
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	782	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1412	-	573	892
Mov Cap-2 Maneuver	-	-	-	-	573	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	749	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	749	-	-	1412	-
HCM Lane V/C Ratio	0.181	-	-	0.039	-
HCM Control Delay (s)	10.9	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	265	168	290	273	44	137	687	264	23	450	96
Future Volume (veh/h)	113	265	168	290	273	44	137	687	264	23	450	96
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1827	1845	1845	1863	1810	1810	1881	1845	1743	1863	1810
Adj Flow Rate, veh/h	127	298	189	326	307	49	154	772	297	26	506	108
Adj No. of Lanes	1	1	1	2	1	1	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	4	3	3	2	5	5	1	3	9	2	5
Cap, veh/h	160	431	370	419	502	406	189	784	846	34	611	505
Arrive On Green	0.09	0.24	0.24	0.12	0.27	0.27	0.11	0.42	0.42	0.02	0.33	0.33
Sat Flow, veh/h	1792	1827	1568	3408	1863	1505	1723	1881	1568	1660	1863	1538
Grp Volume(v), veh/h	127	298	189	326	307	49	154	772	297	26	506	108
Grp Sat Flow(s),veh/h/ln	1792	1827	1568	1704	1863	1505	1723	1881	1568	1660	1863	1538
Q Serve(g_s), s	6.8	14.6	10.3	9.1	14.2	2.4	8.6	39.9	10.6	1.5	24.6	5.0
Cycle Q Clear(g_c), s	6.8	14.6	10.3	9.1	14.2	2.4	8.6	39.9	10.6	1.5	24.6	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	431	370	419	502	406	189	784	846	34	611	505
V/C Ratio(X)	0.79	0.69	0.51	0.78	0.61	0.12	0.82	0.98	0.35	0.76	0.83	0.21
Avail Cap(c_a), veh/h	365	558	479	867	664	536	438	784	846	338	664	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	34.3	32.6	41.8	31.4	27.1	42.8	28.3	12.8	47.9	30.4	23.8
Incr Delay (d2), s/veh	8.6	4.5	2.3	3.2	2.6	0.3	8.3	28.3	0.5	28.1	9.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	7.9	4.7	4.5	7.6	1.0	4.5	26.7	4.7	1.0	14.2	2.2
LnGrp Delay(d),s/veh	52.5	38.8	34.9	44.9	33.9	27.4	51.1	56.6	13.4	75.9	39.8	24.3
LnGrp LOS	D	D	C	D	C	C	D	E	B	E	D	C
Approach Vol, veh/h		614			682			1223			640	
Approach Delay, s/veh		40.4			38.7			45.4			38.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	46.5	16.6	28.7	15.3	37.7	13.3	32.0
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	20.0	40.0	25.0	30.0	25.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	3.5	41.9	11.1	16.6	10.6	26.6	8.8	16.2
Green Ext Time (p_c), s	0.0	0.0	1.0	6.5	0.3	5.6	0.2	8.1

Intersection Summary	
HCM 2010 Ctrl Delay	41.6
HCM 2010 LOS	D

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	112	0	109	0	981	116	106	802	0
Future Volume (vph)	0	0	142	112	0	109	0	981	116	106	802	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1589	1770		1553		3539	1615	1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1589	1770		1553		3539	1615	1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	117	0	114	0	1022	121	110	835	0
RTOR Reduction (vph)	0	0	141	0	0	88	0	0	53	0	0	0
Lane Group Flow (vph)	0	0	7	117	0	26	0	1022	68	110	835	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			2.9	5.5		12.9		26.8	32.3	4.3	35.1	
Effective Green, g (s)			2.9	5.5		12.9		26.8	32.3	4.3	35.1	
Actuated g/C Ratio			0.05	0.10		0.22		0.47	0.56	0.07	0.61	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			80	169		348		1649	907	133	2160	
v/s Ratio Prot				c0.07				c0.29	0.01	c0.06	0.24	
v/s Ratio Perm			0.00			c0.02			0.03			
v/c Ratio			0.09	0.69		0.07		0.62	0.07	0.83	0.39	
Uniform Delay, d1			26.0	25.2		17.6		11.5	5.8	26.2	5.7	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.5	11.6		0.1		0.8	0.0	31.2	0.2	
Delay (s)			26.6	36.8		17.7		12.3	5.8	57.5	5.9	
Level of Service			C	D		B		B	A	E	A	
Approach Delay (s)		26.6			27.4			11.6			11.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

07/15/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	26	288	107	24	33	218	1143	69	61	1179	89
Future Volume (veh/h)	176	26	288	107	24	33	218	1143	69	61	1179	89
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1863	1863	1863	1881
Adj Flow Rate, veh/h	187	28	306	114	26	35	232	1216	73	65	1254	95
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	226	262	391	145	185	154	272	1966	879	85	1577	703
Arrive On Green	0.12	0.14	0.14	0.08	0.10	0.10	0.16	0.56	0.56	0.05	0.45	0.45
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	3539	1582	1774	3539	1577
Grp Volume(v), veh/h	187	28	306	114	26	35	232	1216	73	65	1254	95
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1770	1582	1774	1770	1577
Q Serve(g_s), s	10.0	1.3	10.8	6.3	1.3	2.1	13.0	23.2	2.1	3.6	30.3	3.5
Cycle Q Clear(g_c), s	10.0	1.3	10.8	6.3	1.3	2.1	13.0	23.2	2.1	3.6	30.3	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	262	391	145	185	154	272	1966	879	85	1577	703
V/C Ratio(X)	0.83	0.11	0.78	0.78	0.14	0.23	0.85	0.62	0.08	0.77	0.80	0.14
Avail Cap(c_a), veh/h	545	550	823	529	550	459	779	1966	879	356	1777	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	37.1	41.2	44.8	40.8	41.2	40.8	15.0	10.3	46.9	23.7	16.3
Incr Delay (d2), s/veh	7.5	0.2	3.4	8.9	0.3	0.7	7.5	0.9	0.1	13.4	2.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.7	4.2	3.4	0.7	0.9	6.8	11.4	1.0	2.1	15.4	1.6
LnGrp Delay(d),s/veh	50.1	37.3	44.6	53.7	41.2	41.9	48.3	15.9	10.4	60.2	26.6	16.5
LnGrp LOS	D	D	D	D	D	D	D	B	B	E	C	B
Approach Vol, veh/h		521			175			1521			1414	
Approach Delay, s/veh		46.2			49.5			20.5			27.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	60.3	12.2	18.3	19.7	49.4	16.4	14.1
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	5.6	25.2	8.3	12.8	15.0	32.3	12.0	4.1
Green Ext Time (p_c), s	0.1	23.8	0.3	1.5	0.7	12.1	0.5	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	28.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	0	113	456	104	348	272	1046	262	0	1470	94
Future Volume (veh/h)	77	0	113	456	104	348	272	1046	262	0	1470	94
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1833	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	82	0	120	485	305	240	289	1113	279	0	1564	100
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	106	0	0	562	350	294	323	2980	937	0	1789	585
Arrive On Green	0.06	0.00	0.00	0.16	0.19	0.19	0.18	0.59	0.59	0.00	0.37	0.37
Sat Flow, veh/h	1810	82		3514	1833	1538	1792	5036	1583	0	5055	1599
Grp Volume(v), veh/h	82	47.2		485	305	240	289	1113	279	0	1564	100
Grp Sat Flow(s),veh/h/ln	1810	D		1757	1833	1538	1792	1679	1583	0	1631	1599
Q Serve(g_s), s	4.1			12.4	14.8	13.7	14.5	10.6	8.0	0.0	27.4	3.9
Cycle Q Clear(g_c), s	4.1			12.4	14.8	13.7	14.5	10.6	8.0	0.0	27.4	3.9
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	106			562	350	294	323	2980	937	0	1789	585
V/C Ratio(X)	0.77			0.86	0.87	0.82	0.89	0.37	0.30	0.00	0.87	0.17
Avail Cap(c_a), veh/h	394			2274	698	586	585	3791	1192	0	1863	609
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.7			37.6	36.1	35.6	36.8	9.8	9.3	0.0	27.2	19.7
Incr Delay (d2), s/veh	4.5			1.6	2.7	2.1	3.5	0.0	0.1	0.0	4.6	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2			6.1	7.8	6.0	7.5	4.9	3.5	0.0	13.1	1.7
LnGrp Delay(d),s/veh	47.2			39.2	38.7	37.8	40.3	9.9	9.4	0.0	31.8	19.8
LnGrp LOS	D			D	D	D	D	A	A		C	B
Approach Vol, veh/h					1030			1681			1664	
Approach Delay, s/veh					38.7			15.0			31.0	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		60.1	19.1		20.8	39.3	9.5	22.4
Change Period (Y+Rc), s		5.7	4.4		* 4.2	5.7	4.1	4.8
Max Green Setting (Gmax), s		69.2	59.5		* 30	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s		12.6	14.4		16.5	29.4	6.1	16.8
Green Ext Time (p_c), s		13.6	0.4		0.1	4.2	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	493	225	60	105	0	311	0	1317	88	280	800	509
Future Volume (veh/h)	493	225	60	105	0	311	0	1317	88	280	800	509
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1881	0	1881	0	1827	1900	1881	1845	1881
Adj Flow Rate, veh/h	519	237	63	111	0	327	0	1386	93	295	842	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	1	0	1	0	4	0	1	3	1
Cap, veh/h	695	387	170	181	0	0	0	2302	591	413	1951	890
Arrive On Green	0.20	0.11	0.11	0.10	0.00	0.00	0.00	0.37	0.37	0.12	0.56	0.00
Sat Flow, veh/h	3442	3610	1583	1792	111		0	6540	1615	3476	3505	1599
Grp Volume(v), veh/h	519	237	63	111	26.0		0	1386	93	295	842	0
Grp Sat Flow(s),veh/h/ln	1721	1805	1583	1792	C		0	1571	1615	1738	1752	1599
Q Serve(g_s), s	8.1	3.6	2.1	3.4			0.0	10.3	2.2	4.7	8.0	0.0
Cycle Q Clear(g_c), s	8.1	3.6	2.1	3.4			0.0	10.3	2.2	4.7	8.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	695	387	170	181			0	2302	591	413	1951	890
V/C Ratio(X)	0.75	0.61	0.37	0.61			0.00	0.60	0.16	0.71	0.43	0.00
Avail Cap(c_a), veh/h	2998	2201	965	1248			0	4927	1266	1514	4524	2064
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	24.5	23.8	24.7			0.0	14.8	12.2	24.3	7.4	0.0
Incr Delay (d2), s/veh	1.2	0.6	0.5	1.2			0.0	0.1	0.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	1.8	1.0	1.7			0.0	4.4	1.0	2.3	3.9	0.0
LnGrp Delay(d),s/veh	22.7	25.1	24.3	26.0			0.0	14.9	12.3	25.2	7.5	0.0
LnGrp LOS	C	C	C	C				B	B	C	A	
Approach Vol, veh/h		819						1479			1137	
Approach Delay, s/veh		23.5						14.7			12.1	
Approach LOS		C						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	10.9	26.7	9.5	10.2		37.6	15.7	
Change Period (Y+Rc), s	4.1	5.7	3.7	4.1		5.7	4.1	
Max Green Setting (Gmax), s	25.0	45.0	40.0	35.0		74.1	50.0	
Max Q Clear Time (g_c+I1), s	6.7	12.3	5.4	5.6		10.0	10.1	
Green Ext Time (p_c), s	0.2	8.7	0.0	0.6		9.2	1.5	

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Notes

HCM Unsignalized Intersection Capacity Analysis
11: Sierra College Blvd & Schriber Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	94	1313	64	0	965
Future Volume (Veh/h)	0	94	1313	64	0	965
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	102	1427	70	0	1049
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			443			404
pX, platoon unblocked	0.93	0.89			0.89	
vC, conflicting volume	1988	393			1498	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998	0			926	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	89			100	
cM capacity (veh/h)	226	964			662	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	102	408	408	408	274	524	524
Volume Left	0	0	0	0	0	0	0
Volume Right	102	0	0	0	70	0	0
cSH	964	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.24	0.24	0.24	0.16	0.31	0.31
Queue Length 95th (ft)	9	0	0	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.2	0.0				0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	1	75	0	11	2	1361	56	26	940	1
Future Volume (veh/h)	5	0	1	75	0	11	2	1361	56	26	940	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1776	1900	1900	1900	1863	1863	1696	1881	1900
Adj Flow Rate, veh/h	5	0	1	82	0	12	2	1479	61	28	1022	1
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	7	0	0	0	2	2	12	1	0
Cap, veh/h	12	0	2	162	84	71	5	3531	1099	46	2573	1162
Arrive On Green	0.01	0.00	0.00	0.05	0.00	0.04	0.00	0.69	0.69	0.03	0.72	0.72
Sat Flow, veh/h	1810	0	1615	3281	1900	1615	1810	5085	1582	1616	3574	1614
Grp Volume(v), veh/h	5	0	1	82	0	12	2	1479	61	28	1022	1
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1640	1900	1615	1810	1695	1582	1616	1787	1614
Q Serve(g_s), s	0.2	0.0	0.1	2.1	0.0	0.6	0.1	11.0	1.1	1.5	9.8	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.1	2.1	0.0	0.6	0.1	11.0	1.1	1.5	9.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	12	0	2	162	84	71	5	3531	1099	46	2573	1162
V/C Ratio(X)	0.42	0.00	0.45	0.51	0.00	0.17	0.41	0.42	0.06	0.61	0.40	0.00
Avail Cap(c_a), veh/h	622	0	740	1127	870	740	622	3531	1099	1110	3683	1663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	0.0	43.6	40.5	0.0	40.2	43.5	5.8	4.2	42.0	4.8	3.4
Incr Delay (d2), s/veh	22.2	0.0	117.9	2.4	0.0	1.3	46.4	0.1	0.0	12.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	1.0	0.0	0.3	0.1	5.1	0.5	0.8	4.7	0.0
LnGrp Delay(d),s/veh	65.4	0.0	161.5	42.9	0.0	41.5	89.9	5.9	4.3	54.6	4.9	3.4
LnGrp LOS	E		F	D		D	F	A	A	D	A	A
Approach Vol, veh/h		6			94			1542			1051	
Approach Delay, s/veh		81.4			42.7			5.9			6.2	
Approach LOS		F			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	66.4	8.8	5.1	4.7	68.7	5.1	8.9
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	60.0	60.0	30.0	40.0	30.0	90.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	3.5	13.0	4.1	2.1	2.1	11.8	2.2	2.6
Green Ext Time (p_c), s	0.1	36.2	0.2	0.0	0.0	51.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	74	26	1211	903	67
Future Volume (veh/h)	119	74	26	1211	903	67
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1865	1900
Adj Flow Rate, veh/h	125	78	27	1275	951	71
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2
Cap, veh/h	284	130	52	2779	3373	251
Arrive On Green	0.08	0.08	0.03	0.79	0.70	0.70
Sat Flow, veh/h	3510	1615	1810	3632	5004	360
Grp Volume(v), veh/h	125	78	27	1275	667	355
Grp Sat Flow(s),veh/h/ln	1755	1615	1810	1770	1697	1801
Q Serve(g_s), s	2.6	3.6	1.1	9.2	5.6	5.7
Cycle Q Clear(g_c), s	2.6	3.6	1.1	9.2	5.6	5.7
Prop In Lane	1.00	1.00	1.00			0.20
Lane Grp Cap(c), veh/h	284	130	52	2779	2368	1257
V/C Ratio(X)	0.44	0.60	0.52	0.46	0.28	0.28
Avail Cap(c_a), veh/h	1844	849	951	4858	2676	1420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	33.8	36.5	2.7	4.3	4.3
Incr Delay (d2), s/veh	1.1	4.3	7.9	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.7	0.7	4.5	2.6	2.8
LnGrp Delay(d),s/veh	34.4	38.1	44.4	2.9	4.4	4.5
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	203			1302	1022	
Approach Delay, s/veh	35.8			3.7	4.4	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.6	6.7	58.8				65.5
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		40.0	40.0	60.0				104.5
Max Q Clear Time (g_c+I1), s		5.6	3.1	7.7				11.2
Green Ext Time (p_c), s		0.7	0.0	35.1				48.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	301	343	51	221	134	307	921	43	147	678	167
Future Volume (veh/h)	230	301	343	51	221	134	307	921	43	147	678	167
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1845	1900	1900	1810	1900	1863	1863	1900	1863	1863	1845
Adj Flow Rate, veh/h	247	324	369	55	238	144	330	990	46	158	729	180
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	0	0	5	5	2	2	2	2	2	3
Cap, veh/h	282	1306	597	73	531	308	458	1079	50	190	1463	441
Arrive On Green	0.16	0.37	0.37	0.04	0.26	0.26	0.13	0.31	0.31	0.11	0.29	0.29
Sat Flow, veh/h	1792	3505	1602	1810	2077	1204	3442	3443	160	1774	5085	1534
Grp Volume(v), veh/h	247	324	369	55	195	187	330	509	527	158	729	180
Grp Sat Flow(s),veh/h/ln	1792	1752	1602	1810	1719	1562	1721	1770	1833	1774	1695	1534
Q Serve(g_s), s	15.4	7.3	21.5	3.4	10.9	11.6	10.5	31.7	31.7	10.0	13.6	10.8
Cycle Q Clear(g_c), s	15.4	7.3	21.5	3.4	10.9	11.6	10.5	31.7	31.7	10.0	13.6	10.8
Prop In Lane	1.00		1.00	1.00		0.77	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	282	1306	597	73	440	399	458	555	575	190	1463	441
V/C Ratio(X)	0.88	0.25	0.62	0.76	0.44	0.47	0.72	0.92	0.92	0.83	0.50	0.41
Avail Cap(c_a), veh/h	470	1533	701	712	752	683	1204	555	575	466	2002	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	24.8	29.2	54.3	35.7	36.0	47.5	37.8	37.8	50.0	33.9	32.9
Incr Delay (d2), s/veh	9.9	0.4	3.8	14.6	1.0	1.2	4.5	21.8	21.3	8.9	0.4	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	3.6	10.1	2.0	5.3	5.1	5.3	18.8	19.4	5.3	6.4	4.7
LnGrp Delay(d),s/veh	57.0	25.1	33.0	68.8	36.7	37.2	52.0	59.6	59.1	58.9	34.2	33.7
LnGrp LOS	E	C	C	E	D	D	D	E	E	E	C	C
Approach Vol, veh/h		940			437			1366			1067	
Approach Delay, s/veh		36.6			41.0			57.6			37.8	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	40.8	8.6	48.6	19.2	37.9	22.0	35.2
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	30.0	45.0	50.0	40.0	45.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	12.0	33.7	5.4	23.5	12.5	15.6	17.4	13.6
Green Ext Time (p_c), s	0.4	0.0	0.1	13.4	2.7	17.3	0.6	15.7

Intersection Summary	
HCM 2010 Ctrl Delay	45.0
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	34	119	69	34	32	45	573	64	20	466	12
Future Volume (veh/h)	50	34	119	69	34	32	45	573	64	20	466	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1733	1845	1900	1743	1792	1681	1846	1900	1900	1827	1624
Adj Flow Rate, veh/h	55	37	131	76	37	35	49	630	70	22	512	13
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	12	12	3	9	9	6	13	3	3	0	4	17
Cap, veh/h	66	27	542	69	20	526	64	765	85	43	827	611
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.04	0.47	0.47	0.02	0.45	0.45
Sat Flow, veh/h	0	78	1566	0	57	1521	1601	1633	181	1810	1827	1350
Grp Volume(v), veh/h	92	0	131	113	0	35	49	0	700	22	512	13
Grp Sat Flow(s),veh/h/ln	78	0	1566	57	0	1521	1601	0	1814	1810	1827	1350
Q Serve(g_s), s	0.0	0.0	5.2	0.0	0.0	1.3	2.6	0.0	28.9	1.0	18.5	0.5
Cycle Q Clear(g_c), s	30.0	0.0	5.2	30.0	0.0	1.3	2.6	0.0	28.9	1.0	18.5	0.5
Prop In Lane	0.60		1.00	0.67		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	93	0	542	89	0	526	64	0	850	43	827	611
V/C Ratio(X)	0.99	0.00	0.24	1.27	0.00	0.07	0.77	0.00	0.82	0.51	0.62	0.02
Avail Cap(c_a), veh/h	93	0	542	89	0	526	554	0	850	626	1054	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	0.0	20.2	36.9	0.0	19.0	41.2	0.0	19.9	41.8	18.1	13.1
Incr Delay (d2), s/veh	88.7	0.0	0.3	183.9	0.0	0.1	19.6	0.0	7.7	10.6	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	2.3	6.7	0.0	0.6	1.5	0.0	16.2	0.6	9.7	0.2
LnGrp Delay(d),s/veh	123.4	0.0	20.5	220.8	0.0	19.0	60.8	0.0	27.6	52.4	20.1	13.2
LnGrp LOS	F		C	F		B	E		C	D	C	B
Approach Vol, veh/h		223			148			749			547	
Approach Delay, s/veh		63.0			173.1			29.8			21.3	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	46.0		34.5	7.6	44.6		34.5
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	30.0	40.0		30.0	30.0	50.0		30.0
Max Q Clear Time (g_c+I1), s	3.0	30.9		32.0	4.6	20.5		32.0
Green Ext Time (p_c), s	0.0	7.4		0.0	0.1	18.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.2
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	85	22	651	120	208	43	603	520	99	612	33
Future Volume (veh/h)	35	85	22	651	120	208	43	603	520	99	612	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1841	1900	1881	1870	1900	1900	1845	1881	1900	1860	1900
Adj Flow Rate, veh/h	37	90	23	784	0	221	46	641	553	105	651	35
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	1	3	0	0	3	1	0	2	2
Cap, veh/h	120	191	47	928	0	416	60	1556	709	133	1650	89
Arrive On Green	0.07	0.07	0.07	0.26	0.00	0.26	0.03	0.44	0.44	0.07	0.48	0.48
Sat Flow, veh/h	1740	2771	682	3583	0	1606	1810	3505	1597	1810	3407	183
Grp Volume(v), veh/h	37	56	57	784	0	221	46	641	553	105	337	349
Grp Sat Flow(s),veh/h/ln	1740	1749	1703	1792	0	1606	1810	1752	1597	1810	1767	1823
Q Serve(g_s), s	2.4	3.7	3.9	24.8	0.0	14.2	3.0	14.9	35.2	6.8	14.6	14.6
Cycle Q Clear(g_c), s	2.4	3.7	3.9	24.8	0.0	14.2	3.0	14.9	35.2	6.8	14.6	14.6
Prop In Lane	1.00		0.40	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	120	120	117	928	0	416	60	1556	709	133	856	883
V/C Ratio(X)	0.31	0.46	0.49	0.85	0.00	0.53	0.76	0.41	0.78	0.79	0.39	0.39
Avail Cap(c_a), veh/h	407	409	398	1796	0	805	302	1757	801	529	886	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	53.6	53.7	42.1	0.0	38.1	57.4	22.6	28.3	54.5	19.7	19.7
Incr Delay (d2), s/veh	1.4	2.7	3.1	2.2	0.0	1.1	18.0	0.2	4.9	9.8	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.9	1.9	12.6	0.0	6.4	1.8	7.3	16.5	3.8	7.2	7.5
LnGrp Delay(d),s/veh	54.4	56.3	56.8	44.3	0.0	39.2	75.4	22.9	33.2	64.4	20.1	20.1
LnGrp LOS	D	E	E	D		D	E	C	C	E	C	C
Approach Vol, veh/h		150			1005			1240			791	
Approach Delay, s/veh		56.0			43.2			29.4			26.0	
Approach LOS		E			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	58.1		13.2	8.0	63.0		35.5
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	35.0	60.0		28.0	20.0	60.0		60.0
Max Q Clear Time (g_c+I1), s	8.8	37.2		5.9	5.0	16.6		26.8
Green Ext Time (p_c), s	0.3	15.9		0.6	0.1	24.0		4.1

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	654	14	36	852	417	49	19	11	470	19	226
Future Volume (veh/h)	183	654	14	36	852	417	49	19	11	470	19	226
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1845	1881	1776	1900	1900	1900	1863	1866	1900
Adj Flow Rate, veh/h	191	681	15	38	888	0	51	20	11	504	0	235
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	3	1	7	0	0	0	2	0	0
Cap, veh/h	209	1359	30	49	1045	441	472	300	165	660	0	299
Arrive On Green	0.12	0.38	0.38	0.03	0.29	0.00	0.26	0.26	0.26	0.19	0.00	0.19
Sat Flow, veh/h	1810	3576	79	1757	3574	1509	1810	1151	633	3548	0	1605
Grp Volume(v), veh/h	191	340	356	38	888	0	51	0	31	504	0	235
Grp Sat Flow(s),veh/h/ln	1810	1788	1867	1757	1787	1509	1810	0	1785	1774	0	1605
Q Serve(g_s), s	14.0	19.6	19.6	2.9	31.4	0.0	2.9	0.0	1.8	18.1	0.0	18.7
Cycle Q Clear(g_c), s	14.0	19.6	19.6	2.9	31.4	0.0	2.9	0.0	1.8	18.1	0.0	18.7
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	209	679	710	49	1045	441	472	0	465	660	0	299
V/C Ratio(X)	0.91	0.50	0.50	0.78	0.85	0.00	0.11	0.00	0.07	0.76	0.00	0.79
Avail Cap(c_a), veh/h	209	679	710	268	1198	506	472	0	465	925	0	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.7	31.9	31.9	64.8	44.7	0.0	37.8	0.0	37.3	51.8	0.0	52.1
Incr Delay (d2), s/veh	39.4	2.1	2.0	22.6	7.8	0.0	0.5	0.0	0.3	3.2	0.0	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	10.0	10.5	1.7	16.7	0.0	1.5	0.0	0.9	9.2	0.0	9.0
LnGrp Delay(d),s/veh	98.1	33.9	33.9	87.5	52.5	0.0	38.2	0.0	37.6	55.0	0.0	60.2
LnGrp LOS	F	C	C	F	D		D		D	D		E
Approach Vol, veh/h		887			926			82			739	
Approach Delay, s/veh		47.7			53.9			38.0			56.6	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.0	8.2	56.0		30.0	20.0	44.3
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		35.0	20.5	45.0		35.0	15.5	45.0
Max Q Clear Time (g_c+I1), s		4.9	4.9	21.6		20.7	16.0	33.4
Green Ext Time (p_c), s		0.3	0.0	19.8		3.7	0.0	5.9

Intersection Summary	
HCM 2010 Ctrl Delay	52.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	683	472	541	1070	0	0	0	0	43	3	296
Future Volume (veh/h)	0	683	472	541	1070	0	0	0	0	43	3	296
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1863	1863	1827	0				1900	1863	1900
Adj Flow Rate, veh/h	0	719	497	569	1126	0				45	3	312
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	2	4	0				0	0	0
Cap, veh/h	0	1008	445	597	2356	0				403	3	349
Arrive On Green	0.00	0.28	0.28	0.34	0.68	0.00				0.22	0.22	0.22
Sat Flow, veh/h	0	3668	1578	1774	3563	0				1810	15	1571
Grp Volume(v), veh/h	0	719	497	569	1126	0				45	0	315
Grp Sat Flow(s),veh/h/ln	0	1787	1578	1774	1736	0				1810	0	1586
Q Serve(g_s), s	0.0	16.8	26.2	29.1	14.4	0.0				1.8	0.0	17.9
Cycle Q Clear(g_c), s	0.0	16.8	26.2	29.1	14.4	0.0				1.8	0.0	17.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1008	445	597	2356	0				403	0	353
V/C Ratio(X)	0.00	0.71	1.12	0.95	0.48	0.00				0.11	0.00	0.89
Avail Cap(c_a), veh/h	0	1008	445	610	2356	0				506	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.77	0.77	0.38	0.38	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.0	33.4	30.2	7.1	0.0				28.8	0.0	35.1
Incr Delay (d2), s/veh	0.0	3.3	73.7	12.8	0.3	0.0				0.0	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.8	20.5	16.3	6.8	0.0				0.9	0.0	9.4
LnGrp Delay(d),s/veh	0.0	33.3	107.1	43.0	7.4	0.0				28.9	0.0	50.2
LnGrp LOS		C	F	D	A					C		D
Approach Vol, veh/h		1216			1695						360	
Approach Delay, s/veh		63.5			19.3						47.5	
Approach LOS		E			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	36.9	31.3		24.8		68.2		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	32.0	20.4		26.0		58.0		
Max Q Clear Time (g_c+I1), s	31.1	28.2		19.9		16.4		
Green Ext Time (p_c), s	0.1	0.0		0.8		15.1		

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	524	0	0	1104	99	507	4	517	0	0	0
Future Volume (veh/h)	202	524	0	0	1104	99	507	4	517	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1900	1810	1839	1863			
Adj Flow Rate, veh/h	220	570	0	0	1200	108	729	0	374			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	1	0	0	1	1	5	0	2			
Cap, veh/h	253	2202	0	0	1449	130	1007	0	463			
Arrive On Green	0.14	0.62	0.00	0.00	0.44	0.44	0.29	0.00	0.29			
Sat Flow, veh/h	1774	3668	0	0	3412	298	3447	0	1583			
Grp Volume(v), veh/h	220	570	0	0	645	663	729	0	374			
Grp Sat Flow(s),veh/h/ln	1774	1787	0	0	1787	1829	1723	0	1583			
Q Serve(g_s), s	11.5	6.9	0.0	0.0	30.2	30.4	18.0	0.0	20.8			
Cycle Q Clear(g_c), s	11.5	6.9	0.0	0.0	30.2	30.4	18.0	0.0	20.8			
Prop In Lane	1.00		0.00	0.00		0.16	1.00		1.00			
Lane Grp Cap(c), veh/h	253	2202	0	0	781	799	1007	0	463			
V/C Ratio(X)	0.87	0.26	0.00	0.00	0.83	0.83	0.72	0.00	0.81			
Avail Cap(c_a), veh/h	280	2202	0	0	781	799	1234	0	567			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.71	0.71	0.00	0.00	0.84	0.84	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.9	8.3	0.0	0.0	23.6	23.6	30.2	0.0	31.1			
Incr Delay (d2), s/veh	16.0	0.2	0.0	0.0	8.3	8.3	2.0	0.0	7.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.7	3.5	0.0	0.0	16.7	17.1	8.9	0.0	10.1			
LnGrp Delay(d),s/veh	55.9	8.5	0.0	0.0	31.9	31.9	32.2	0.0	39.1			
LnGrp LOS	E	A			C	C	C		D			
Approach Vol, veh/h		790			1308			1103				
Approach Delay, s/veh		21.7			31.9			34.5				
Approach LOS		C			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.1			17.0	46.1		31.9
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		52.0			15.0	33.5		34.0
Max Q Clear Time (g_c+I1), s		8.9			13.5	32.4		22.8
Green Ext Time (p_c), s		12.1			0.1	0.9		5.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	913	116	22	1117	0	86	0	21	0	0	0
Future Volume (veh/h)	52	913	116	22	1117	0	86	0	21	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1861	1900	1900	1863	0	1827	0	1810			
Adj Flow Rate, veh/h	57	1003	127	24	1227	0	95	0	23			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	0	4	0	5			
Cap, veh/h	103	2237	283	38	2388	0	134	0	118			
Arrive On Green	0.06	0.71	0.71	0.02	0.67	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3148	398	1810	3632	0	1740	0	1538			
Grp Volume(v), veh/h	57	563	567	24	1227	0	95	0	23			
Grp Sat Flow(s),veh/h/ln	1810	1768	1779	1810	1770	0	1740	0	1538			
Q Serve(g_s), s	2.2	9.5	9.6	0.9	12.2	0.0	3.8	0.0	1.0			
Cycle Q Clear(g_c), s	2.2	9.5	9.6	0.9	12.2	0.0	3.8	0.0	1.0			
Prop In Lane	1.00		0.22	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	103	1256	1264	38	2388	0	134	0	118			
V/C Ratio(X)	0.55	0.45	0.45	0.62	0.51	0.00	0.71	0.00	0.19			
Avail Cap(c_a), veh/h	641	1256	1264	641	2506	0	616	0	544			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	32.4	4.3	4.3	34.3	5.7	0.0	31.8	0.0	30.5			
Incr Delay (d2), s/veh	4.5	0.7	0.7	15.4	0.5	0.0	6.7	0.0	0.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	4.8	4.8	0.6	6.0	0.0	2.0	0.0	0.4			
LnGrp Delay(d),s/veh	36.9	5.0	5.0	49.6	6.2	0.0	38.5	0.0	31.3			
LnGrp LOS	D	A	A	D	A		D		C			
Approach Vol, veh/h		1187			1251			118				
Approach Delay, s/veh		6.6			7.0			37.1				
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	5.5	55.2			8.0	52.6		9.9
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	25.0	50.0			25.0	50.0		25.0
Max Q Clear Time (g_c+I1), s	2.9	11.6			4.2	14.2		5.8
Green Ext Time (p_c), s	0.0	35.9			0.1	33.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1097	1055	2
Future Vol, veh/h	0	20	5	1097	1055	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1131	1088	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	545	1090	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	475	648	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	475	648	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	648	-	475	-	-
HCM Lane V/C Ratio	0.008	-	0.043	-	-
HCM Control Delay (s)	10.6	-	12.9	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	52	51	349	262	49
Future Vol, veh/h	65	52	51	349	262	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	57	55	379	285	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	612	169	338	0	-	0
Stage 1	311	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	425	845	1218	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	406	845	1218	-	-	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1218	-	406	845	-	-
HCM Lane V/C Ratio	0.046	-	0.174	0.067	-	-
HCM Control Delay (s)	8.1	-	15.7	9.6	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	599	132	22	606	39	116	3	27	68	10	349
Future Volume (veh/h)	179	599	132	22	606	39	116	3	27	68	10	349
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	195	651	143	24	659	42	126	3	29	74	11	379
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	236	1074	236	139	1110	71	167	14	137	410	61	418
Arrive On Green	0.13	0.37	0.37	0.08	0.33	0.33	0.09	0.09	0.09	0.26	0.26	0.26
Sat Flow, veh/h	1774	2887	633	1774	3379	215	1774	151	1455	1554	231	1583
Grp Volume(v), veh/h	195	399	395	24	345	356	126	0	32	85	0	379
Grp Sat Flow(s),veh/h/ln	1774	1770	1751	1774	1770	1825	1774	0	1606	1785	0	1583
Q Serve(g_s), s	10.1	17.2	17.2	1.2	15.3	15.3	6.5	0.0	1.7	3.5	0.0	21.8
Cycle Q Clear(g_c), s	10.1	17.2	17.2	1.2	15.3	15.3	6.5	0.0	1.7	3.5	0.0	21.8
Prop In Lane	1.00		0.36	1.00		0.12	1.00		0.91	0.87		1.00
Lane Grp Cap(c), veh/h	236	658	651	139	581	599	167	0	151	471	0	418
V/C Ratio(X)	0.83	0.61	0.61	0.17	0.59	0.59	0.75	0.00	0.21	0.18	0.00	0.91
Avail Cap(c_a), veh/h	566	1130	1118	566	1130	1165	566	0	513	570	0	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.7	23.9	24.0	40.4	26.3	26.3	41.5	0.0	39.3	26.7	0.0	33.5
Incr Delay (d2), s/veh	7.3	3.2	3.3	0.6	3.5	3.4	6.8	0.0	0.7	0.2	0.0	17.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	8.9	8.9	0.6	8.0	8.3	3.5	0.0	0.8	1.7	0.0	11.6
LnGrp Delay(d),s/veh	47.0	27.2	27.2	41.0	29.8	29.7	48.3	0.0	40.0	26.9	0.0	51.3
LnGrp LOS	D	C	C	D	C	C	D		D	C		D
Approach Vol, veh/h		989			725			158			464	
Approach Delay, s/veh		31.1			30.2			46.6			46.9	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.4	39.9		12.8	16.5	35.9		28.8
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	30.0	* 60		30.0	30.0	60.0		30.0
Max Q Clear Time (g_c+I1), s	3.2	19.2		8.5	12.1	17.3		23.8
Green Ext Time (p_c), s	11.1	15.7		0.5	0.5	13.5		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	402	161	947	387	142	933
Future Volume (veh/h)	402	161	947	387	142	933
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	437	175	1029	421	154	1014
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	651	299	2229	993	199	2255
Arrive On Green	0.19	0.19	0.44	0.44	0.11	0.64
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	437	175	1029	421	154	1014
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	6.1	5.2	7.4	7.0	4.4	7.5
Cycle Q Clear(g_c), s	6.1	5.2	7.4	7.0	4.4	7.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	651	299	2229	993	199	2255
V/C Ratio(X)	0.67	0.58	0.46	0.42	0.78	0.45
Avail Cap(c_a), veh/h	1196	550	2229	993	360	2255
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	19.1	10.2	4.9	22.4	4.8
Incr Delay (d2), s/veh	1.2	1.8	0.7	1.3	6.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.4	3.6	4.9	2.5	3.7
LnGrp Delay(d),s/veh	20.7	21.0	10.9	6.2	28.7	5.4
LnGrp LOS	C	C	B	A	C	A
Approach Vol, veh/h	612		1450			1168
Approach Delay, s/veh	20.8		9.6			8.5
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.3	27.2				37.5		14.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	6.4	9.4				9.5		8.1
Green Ext Time (p_c), s	0.1	7.5				17.6		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	215	7	0	221	0	3
Future Vol, veh/h	215	7	0	221	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	234	8	0	240	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	238
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	801
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	801
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	801	-	-	-
HCM Lane V/C Ratio	0.004	-	-	-
HCM Control Delay (s)	9.5	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Intersection Delay, s/veh	45.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	291	252	81	251	0	498	0	133	0	0	0
Future Vol, veh/h	1	291	252	81	251	0	498	0	133	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	7	3	7	6	0	5	0	4	0	0	0
Mvmt Flow	1	303	263	84	261	0	519	0	139	0	0	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	19.3	18.6	82.9	0
HCM LOS	C	C	F	-

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	498	133	292	252	81	251	0
LT Vol	498	0	1	0	81	0	0
Through Vol	0	0	291	0	0	251	0
RT Vol	0	133	0	252	0	0	0
Lane Flow Rate	519	139	304	262	84	261	0
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	1.11	0.246	0.615	0.489	0.191	0.555	0
Departure Headway (Hd)	7.702	6.394	7.661	7.06	8.572	8.037	9.114
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	472	562	475	515	421	452	0
Service Time	5.44	4.131	5.361	4.76	6.272	5.737	7.114
HCM Lane V/C Ratio	1.1	0.247	0.64	0.509	0.2	0.577	0
HCM Control Delay	102.1	11.2	21.8	16.3	13.3	20.3	12.1
HCM Lane LOS	F	B	C	C	B	C	N
HCM 95th-tile Q	17.5	1	4.1	2.7	0.7	3.3	0

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	67	835	7	98	432
Future Vol, veh/h	5	67	835	7	98	432
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	2	0	2	5
Mvmt Flow	5	72	898	8	105	465

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1577	902	0	0	905	0
Stage 1	902	-	-	-	-	-
Stage 2	675	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	122	339	-	-	752	-
Stage 1	399	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	105	339	-	-	752	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	439	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	294	752	-
HCM Lane V/C Ratio	-	-	0.263	0.14	-
HCM Control Delay (s)	-	-	21.6	10.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1	0.5	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	3	33	1	5	9	833	71	2	437	1
Future Vol, veh/h	2	2	3	33	1	5	9	833	71	2	437	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	1	0	5	0
Mvmt Flow	2	2	3	36	1	5	10	905	77	2	475	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1406	1405	476	1406	1405	905	476	0	0	905	0	0
Stage 1	480	480	-	925	925	-	-	-	-	-	-	-
Stage 2	926	925	-	481	480	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	118	141	593	118	141	338	1097	-	-	760	-	-
Stage 1	571	558	-	325	351	-	-	-	-	-	-	-
Stage 2	325	351	-	570	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	139	593	115	139	338	1097	-	-	760	-	-
Mov Cap-2 Maneuver	114	139	-	115	139	-	-	-	-	-	-	-
Stage 1	566	557	-	322	348	-	-	-	-	-	-	-
Stage 2	316	348	-	563	557	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.6	45.5	0.1	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1097	-	-	125	593	116	338	760	-	-
HCM Lane V/C Ratio	0.009	-	-	0.035	0.005	0.319	0.016	0.003	-	-
HCM Control Delay (s)	8.3	-	-	34.8	11.1	49.9	15.8	9.8	-	-
HCM Lane LOS	A	-	-	D	B	E	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	1.2	0	0	-	-

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	28	91	51	21	11	101	212	80	7	129	79
Future Vol, veh/h	87	28	91	51	21	11	101	212	80	7	129	79
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	5	0	5	0	5	0	4	2	1	0	5	4
Mvmt Flow	98	31	102	57	24	12	113	238	90	8	145	89
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	11.8	12.2	15.6	11.5
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	76%	0%	61%	100%	0%	0%
Vol Thru, %	0%	73%	24%	0%	25%	0%	100%	0%
Vol Right, %	0%	27%	0%	100%	13%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	101	292	115	91	83	7	129	79
LT Vol	101	0	87	0	51	7	0	0
Through Vol	0	212	28	0	21	0	129	0
RT Vol	0	80	0	91	11	0	0	79
Lane Flow Rate	113	328	129	102	93	8	145	89
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.219	0.566	0.265	0.177	0.197	0.016	0.278	0.152
Departure Headway (Hd)	6.943	6.206	7.396	6.22	7.607	7.326	6.904	6.174
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	514	577	482	572	475	485	516	576
Service Time	4.722	3.984	5.191	4.014	5.307	5.12	4.698	3.968
HCM Lane V/C Ratio	0.22	0.568	0.268	0.178	0.196	0.016	0.281	0.155
HCM Control Delay	11.7	16.9	12.9	10.4	12.2	10.2	12.4	10.1
HCM Lane LOS	B	C	B	B	B	B	B	B
HCM 95th-tile Q	0.8	3.5	1.1	0.6	0.7	0	1.1	0.5

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	28	411	278	1
Future Vol, veh/h	0	11	28	411	278	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	2	3	0
Mvmt Flow	0	13	33	478	323	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	867	324	324	0	-	0
Stage 1	324	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	326	722	1225	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	317	722	1225	-	-	-
Mov Cap-2 Maneuver	317	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1225	-	722	-	-
HCM Lane V/C Ratio	0.027	-	0.018	-	-
HCM Control Delay (s)	8	-	10.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	6.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	193	246	32	133	156
Future Vol, veh/h	43	193	246	32	133	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	10	2	1	7	5	1
Mvmt Flow	49	219	280	36	151	177

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	778	298	0	0	316	0
Stage 1	298	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Critical Hdwy	6.5	6.22	-	-	4.15	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	-	-	2.245	-
Pot Cap-1 Maneuver	354	741	-	-	1227	-
Stage 1	735	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	310	741	-	-	1227	-
Mov Cap-2 Maneuver	310	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	3.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	591	1227	-
HCM Lane V/C Ratio	-	-	0.454	0.123	-
HCM Control Delay (s)	-	-	16.1	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.4	0.4	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	9	287	7	5	196
Future Vol, veh/h	40	9	287	7	5	196
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	43	10	305	7	5	209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	528	309	0	0	313	0
Stage 1	309	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	514	736	-	-	1259	-
Stage 1	749	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	512	736	-	-	1259	-
Mov Cap-2 Maneuver	512	-	-	-	-	-
Stage 1	749	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	512	736	1259	-
HCM Lane V/C Ratio	-	-	0.083	0.013	0.004	-
HCM Control Delay (s)	-	-	12.7	10	7.9	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	8	0	286	44	8	228	0
Future Vol, veh/h	0	0	0	38	0	8	0	286	44	8	228	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	3	0	0	0	2	0	0	3	0
Mvmt Flow	0	0	0	42	0	9	0	314	48	9	251	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	611	631	251	606	606	338	251	0	0	363	0	0
Stage 1	268	268	-	338	338	-	-	-	-	-	-	-
Stage 2	343	363	-	268	268	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	409	401	793	408	414	709	1326	-	-	1207	-	-
Stage 1	742	691	-	674	644	-	-	-	-	-	-	-
Stage 2	676	628	-	735	691	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	402	398	793	406	411	709	1326	-	-	1207	-	-
Mov Cap-2 Maneuver	402	398	-	406	411	-	-	-	-	-	-	-
Stage 1	742	686	-	674	644	-	-	-	-	-	-	-
Stage 2	668	628	-	730	686	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.3	0	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1326	-	-	-	439	1207	-	-
HCM Lane V/C Ratio	-	-	-	-	0.115	0.007	-	-
HCM Control Delay (s)	0	-	-	0	14.3	8	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	42	288	160	38	228
Future Vol, veh/h	159	42	288	160	38	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	181	48	327	182	43	259

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	763	418	0	0	509	0
Stage 1	418	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	375	639	-	-	1066	-
Stage 1	669	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	360	639	-	-	1066	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.9	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	475	639	1066	-
HCM Lane V/C Ratio	-	-	0.38	0.075	0.041	-
HCM Control Delay (s)	-	-	17.2	11.1	8.5	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.2	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	31	25	418	370	3
Future Vol, veh/h	3	31	25	418	370	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	3	4	2	3	0
Mvmt Flow	3	35	28	470	416	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	943	417	419	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	294	634	1129	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	287	634	1129	-	-	-
Mov Cap-2 Maneuver	414	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	582	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1129	-	606	-	-
HCM Lane V/C Ratio	0.025	-	0.063	-	-
HCM Control Delay (s)	8.3	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	119	1	1	15	204	730	5	3	738	12
Future Vol, veh/h	0	0	119	1	1	15	204	730	5	3	738	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	7	4	3	0	33	1	0
Mvmt Flow	0	0	125	1	1	16	215	768	5	3	777	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	777	1984	1984	771	777	0	0	774	0	0
Stage 1	-	-	-	1201	1201	-	-	-	-	-	-	-
Stage 2	-	-	-	783	783	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.21	7.1	6.5	6.27	4.14	-	-	4.43	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.309	3.5	4	3.363	2.236	-	-	2.497	-	-
Pot Cap-1 Maneuver	0	0	398	46	62	392	831	-	-	719	-	-
Stage 1	0	0	-	228	260	-	-	-	-	-	-	-
Stage 2	0	0	-	390	407	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	398	25	46	392	831	-	-	719	-	-
Mov Cap-2 Maneuver	-	-	-	25	46	-	-	-	-	-	-	-
Stage 1	-	-	-	169	193	-	-	-	-	-	-	-
Stage 2	-	-	-	266	405	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.1	28.7	2.4	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	831	-	-	398	170	719	-	-
HCM Lane V/C Ratio	0.258	-	-	0.315	0.105	0.004	-	-
HCM Control Delay (s)	10.8	-	-	18.1	28.7	10	-	-
HCM Lane LOS	B	-	-	C	D	B	-	-
HCM 95th %tile Q(veh)	1	-	-	1.3	0.3	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	0	11	218	6	6
Future Vol, veh/h	5	0	11	218	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	0	12	237	7	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	5	0	266	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1616	-	723	1078
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1616	-	718	1078
Mov Cap-2 Maneuver	-	-	-	-	700	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	777	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	849	-	-	1616	-
HCM Lane V/C Ratio	0.015	-	-	0.007	-
HCM Control Delay (s)	9.3	-	-	7.2	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	44	188	156	66	22	189	225	123	22	233	36
Future Volume (veh/h)	50	44	188	156	66	22	189	225	123	22	233	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1667	1827	1881	1810	1900	1863	1863	1845	1900	1853	1900
Adj Flow Rate, veh/h	62	54	232	193	81	27	233	278	152	27	288	44
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	14	4	1	5	5	2	2	3	0	2	2
Cap, veh/h	342	340	309	293	211	70	292	620	513	33	542	82
Arrive On Green	0.20	0.20	0.20	0.16	0.16	0.16	0.16	0.33	0.33	0.02	0.18	0.18
Sat Flow, veh/h	1675	1667	1515	1792	1294	431	1774	1863	1542	1810	3045	458
Grp Volume(v), veh/h	62	54	232	193	0	108	233	278	152	27	165	167
Grp Sat Flow(s),veh/h/ln	1675	1667	1515	1792	0	1726	1774	1863	1542	1810	1760	1742
Q Serve(g_s), s	1.9	1.7	8.9	6.3	0.0	3.5	7.8	7.3	4.5	0.9	5.3	5.4
Cycle Q Clear(g_c), s	1.9	1.7	8.9	6.3	0.0	3.5	7.8	7.3	4.5	0.9	5.3	5.4
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	342	340	309	293	0	282	292	620	513	33	313	310
V/C Ratio(X)	0.18	0.16	0.75	0.66	0.00	0.38	0.80	0.45	0.30	0.83	0.53	0.54
Avail Cap(c_a), veh/h	756	752	683	808	0	779	715	1201	994	743	1135	1123
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	20.3	23.2	24.3	0.0	23.2	24.9	16.2	15.3	30.4	23.1	23.2
Incr Delay (d2), s/veh	0.1	0.1	1.4	1.0	0.0	0.3	5.0	0.2	0.1	17.6	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.8	3.8	3.2	0.0	1.7	4.2	3.7	1.9	0.6	2.6	2.6
LnGrp Delay(d),s/veh	20.5	20.4	24.6	25.3	0.0	23.5	29.9	16.4	15.5	47.9	23.6	23.7
LnGrp LOS	C	C	C	C		C	C	B	B	D	C	C
Approach Vol, veh/h		348			301			663			359	
Approach Delay, s/veh		23.2			24.7			20.9			25.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	26.1		16.7	14.7	16.5		14.1
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	25.5	40.0		28.0	25.0	40.0		28.0
Max Q Clear Time (g_c+I1), s	2.9	9.3		10.9	9.8	7.4		8.3
Green Ext Time (p_c), s	0.0	2.7		0.6	0.6	2.7		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	23.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	14	9	78	24	260	15	325	86	313	398	8
Future Volume (veh/h)	9	14	9	78	24	260	15	325	86	313	398	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1845	1900	1881	1845	1863	1846	1900
Adj Flow Rate, veh/h	10	16	10	89	27	295	17	369	98	356	452	9
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	3	0	1	3	2	3	3
Cap, veh/h	140	186	90	342	88	683	23	612	504	420	991	20
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.01	0.33	0.33	0.24	0.55	0.55
Sat Flow, veh/h	244	933	453	1081	442	1560	1810	1881	1549	1774	1802	36
Grp Volume(v), veh/h	36	0	0	116	0	295	17	369	98	356	0	461
Grp Sat Flow(s),veh/h/ln	1629	0	0	1523	0	1560	1810	1881	1549	1774	0	1838
Q Serve(g_s), s	0.0	0.0	0.0	2.4	0.0	6.6	0.5	8.3	2.3	9.7	0.0	7.6
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.2	0.0	6.6	0.5	8.3	2.3	9.7	0.0	7.6
Prop In Lane	0.28		0.28	0.77		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	417	0	0	430	0	683	23	612	504	420	0	1011
V/C Ratio(X)	0.09	0.00	0.00	0.27	0.00	0.43	0.75	0.60	0.19	0.85	0.00	0.46
Avail Cap(c_a), veh/h	712	0	0	679	0	943	574	1342	1105	563	0	1312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	0.0	17.4	0.0	9.9	24.8	14.3	12.3	18.4	0.0	6.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.4	16.2	1.0	0.2	8.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.4	0.0	2.9	0.3	4.5	1.0	5.7	0.0	3.9
LnGrp Delay(d),s/veh	16.6	0.0	0.0	17.7	0.0	10.3	41.1	15.2	12.4	26.5	0.0	7.1
LnGrp LOS	B			B		B	D	B	B	C		A
Approach Vol, veh/h		36			411			484			817	
Approach Delay, s/veh		16.6			12.4			15.6			15.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.9	20.4		14.1	4.6	31.7		14.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	36.0		20.0	16.0	36.0		18.5
Max Q Clear Time (g_c+I1), s	11.7	10.3		2.8	2.5	9.6		8.6
Green Ext Time (p_c), s	0.4	6.1		1.8	0.0	6.2		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Future Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1843	1810	1845	1859	1900	1881	1870	1900	1845	1827	1881
Adj Flow Rate, veh/h	60	52	65	72	58	48	154	364	94	34	151	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	5	3	4	4	1	2	2	3	4	1
Cap, veh/h	132	114	211	242	130	107	201	820	209	70	402	352
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.29	0.29	0.04	0.22	0.00
Sat Flow, veh/h	962	834	1538	1757	942	780	1792	2805	716	1757	1827	1599
Grp Volume(v), veh/h	112	0	65	72	0	106	154	229	229	34	151	0
Grp Sat Flow(s),veh/h/ln	1795	0	1538	1757	0	1722	1792	1777	1744	1757	1827	1599
Q Serve(g_s), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Cycle Q Clear(g_c), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Prop In Lane	0.54		1.00	1.00		0.45	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	211	242	0	237	201	519	510	70	402	352
V/C Ratio(X)	0.45	0.00	0.31	0.30	0.00	0.45	0.77	0.44	0.45	0.48	0.38	0.00
Avail Cap(c_a), veh/h	1480	0	1268	1207	0	1183	985	1953	1917	965	2008	1758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	14.1	14.1	0.0	14.4	15.7	10.5	10.5	17.1	12.1	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.3	0.3	0.0	0.5	2.3	0.3	0.3	1.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.6	0.7	0.0	1.0	1.6	1.9	1.9	0.4	1.3	0.0
LnGrp Delay(d),s/veh	14.9	0.0	14.4	14.4	0.0	14.9	18.0	10.8	10.8	19.0	12.4	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		177			178			612			185	
Approach Delay, s/veh		14.7			14.7			12.6			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	14.3		8.5	7.1	11.7		9.1
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	20.0	40.0		30.0	20.0	40.0		25.0
Max Q Clear Time (g_c+I1), s	2.7	5.9		4.1	5.0	4.6		4.1
Green Ext Time (p_c), s	0.0	2.8		0.4	0.1	2.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	13.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	304	241	59	80	176
Future Vol, veh/h	130	304	241	59	80	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	1	2	2	4	5
Mvmt Flow	143	334	265	65	88	193

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	634	265	0	0	265	0
Stage 1	265	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.43	6.21	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	-	-	2.236	-
Pot Cap-1 Maneuver	442	776	-	-	1287	-
Stage 1	777	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	408	776	-	-	1287	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	777	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.7	0	2.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	611	1287	-
HCM Lane V/C Ratio	-	-	0.781	0.068	-
HCM Control Delay (s)	-	-	28.7	8	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	7.4	0.2	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	35	115	90	38	100	132
Future Vol, veh/h	35	115	90	38	100	132
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	2	7	5	3
Mvmt Flow	41	134	105	44	116	153

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	174	0	361	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	253	-
Critical Hdwy	-	-	4.12	-	6.45	6.23
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.327
Pot Cap-1 Maneuver	-	-	1403	-	632	943
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	782	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1403	-	583	943
Mov Cap-2 Maneuver	-	-	-	-	583	-
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.5	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	745	-	-	1403	-
HCM Lane V/C Ratio	0.362	-	-	0.075	-
HCM Control Delay (s)	12.6	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0.2	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	113	0	61	0	699	89	91	716	0
Future Volume (vph)	0	0	69	113	0	61	0	699	89	91	716	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1585	1805		1455		3505	1599	1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1585	1805		1455		3505	1599	1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	118	0	64	0	728	93	95	746	0
RTOR Reduction (vph)	0	0	69	0	0	48	0	0	45	0	0	0
Lane Group Flow (vph)	0	0	3	118	0	16	0	728	48	95	746	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			2.0	5.1		11.6		19.5	24.6	2.6	26.1	
Effective Green, g (s)			2.0	5.1		11.6		19.5	24.6	2.6	26.1	
Actuated g/C Ratio			0.04	0.11		0.25		0.41	0.52	0.06	0.55	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			67	195		357		1448	833	96	1956	
v/s Ratio Prot				c0.07				c0.21	0.01	c0.05	0.21	
v/s Ratio Perm			0.00			c0.01			0.02			
v/c Ratio			0.05	0.61		0.04		0.50	0.06	0.99	0.38	
Uniform Delay, d1			21.7	20.1		13.6		10.3	5.6	22.3	6.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.3	5.2		0.1		0.4	0.0	87.4	0.2	
Delay (s)			22.0	25.3		13.6		10.6	5.6	109.7	6.1	
Level of Service			C	C		B		B	A	F	A	
Approach Delay (s)		22.0			21.2			10.1			17.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

07/15/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	23	204	118	24	23	198	884	98	64	999	116
Future Volume (veh/h)	135	23	204	118	24	23	198	884	98	64	999	116
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1863	1881	1845	1863	1881
Adj Flow Rate, veh/h	141	24	212	123	25	24	206	921	102	67	1041	121
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	1	3	2	1
Cap, veh/h	177	195	298	157	166	153	248	2021	912	87	1692	754
Arrive On Green	0.10	0.11	0.11	0.09	0.09	0.09	0.14	0.57	0.57	0.05	0.48	0.48
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	3539	1598	1757	3539	1577
Grp Volume(v), veh/h	141	24	212	123	25	24	206	921	102	67	1041	121
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1770	1598	1757	1770	1577
Q Serve(g_s), s	7.4	1.1	6.8	6.4	1.2	1.3	10.7	14.0	2.7	3.5	20.2	4.0
Cycle Q Clear(g_c), s	7.4	1.1	6.8	6.4	1.2	1.3	10.7	14.0	2.7	3.5	20.2	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	195	298	157	166	153	248	2021	912	87	1692	754
V/C Ratio(X)	0.80	0.12	0.71	0.78	0.15	0.16	0.83	0.46	0.11	0.77	0.62	0.16
Avail Cap(c_a), veh/h	562	591	901	568	569	522	844	2021	912	379	1907	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	37.5	40.1	41.4	38.6	38.6	38.7	11.5	9.1	43.6	17.9	13.7
Incr Delay (d2), s/veh	7.9	0.3	3.2	8.3	0.4	0.5	7.1	0.3	0.1	13.1	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.6	2.7	3.4	0.6	0.6	5.6	6.9	1.2	2.0	10.0	1.8
LnGrp Delay(d),s/veh	48.7	37.8	43.2	49.6	39.0	39.1	45.8	11.9	9.2	56.7	18.8	13.9
LnGrp LOS	D	D	D	D	D	D	D	B	A	E	B	B
Approach Vol, veh/h		377			172			1229			1229	
Approach Delay, s/veh		44.9			46.6			17.3			20.4	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	58.0	12.3	13.9	17.2	49.4	13.4	12.8
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	5.5	16.0	8.4	8.8	12.7	22.2	9.4	3.3
Green Ext Time (p_c), s	0.1	29.7	0.3	1.1	0.6	22.2	0.3	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	195	161	270	168	24	162	349	260	29	376	59
Future Volume (veh/h)	70	195	161	270	168	24	162	349	260	29	376	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	74	207	171	287	179	26	172	371	277	31	400	63
Adj No. of Lanes	1	1	1	2	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	96	358	298	397	465	394	212	785	862	45	615	518
Arrive On Green	0.05	0.19	0.19	0.11	0.25	0.25	0.12	0.43	0.43	0.02	0.33	0.33
Sat Flow, veh/h	1757	1881	1568	3476	1863	1580	1707	1827	1583	1810	1863	1568
Grp Volume(v), veh/h	74	207	171	287	179	26	172	371	277	31	400	63
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1580	1707	1827	1583	1810	1863	1568
Q Serve(g_s), s	3.4	8.3	8.2	6.6	6.6	1.0	8.1	12.1	8.0	1.4	15.2	2.3
Cycle Q Clear(g_c), s	3.4	8.3	8.2	6.6	6.6	1.0	8.1	12.1	8.0	1.4	15.2	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	96	358	298	397	465	394	212	785	862	45	615	518
V/C Ratio(X)	0.77	0.58	0.57	0.72	0.38	0.07	0.81	0.47	0.32	0.70	0.65	0.12
Avail Cap(c_a), veh/h	423	680	567	1047	785	666	514	880	944	436	785	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	30.6	30.5	35.5	25.9	23.8	35.4	16.9	10.5	40.2	23.7	19.4
Incr Delay (d2), s/veh	11.9	3.1	3.7	2.5	1.1	0.1	7.2	0.9	0.5	17.7	2.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.6	3.9	3.3	3.5	0.5	4.2	6.3	3.6	0.9	8.2	1.0
LnGrp Delay(d),s/veh	50.6	33.7	34.2	38.0	27.0	23.9	42.6	17.9	10.9	57.9	26.3	19.6
LnGrp LOS	D	C	C	D	C	C	D	B	B	E	C	B
Approach Vol, veh/h		452			492			820			494	
Approach Delay, s/veh		36.7			33.2			20.7			27.4	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	41.2	14.0	21.3	14.8	32.9	9.1	26.2
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	20.0	40.0	25.0	30.0	25.0	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s	3.4	14.1	8.6	10.3	10.1	17.2	5.4	8.6
Green Ext Time (p_c), s	0.0	12.8	0.9	5.5	0.4	10.2	0.1	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	28.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	0	290	407	149	386	340	735	245	0	1258	82
Future Volume (veh/h)	80	0	290	407	149	386	340	735	245	0	1258	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1830	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	83	0	302	424	340	278	354	766	255	0	1310	85
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	107	0	0	500	384	317	387	2938	906	0	1581	517
Arrive On Green	0.06	0.00	0.00	0.14	0.21	0.21	0.21	0.58	0.58	0.00	0.32	0.32
Sat Flow, veh/h	1810	83		3548	1830	1509	1810	5085	1568	0	5103	1615
Grp Volume(v), veh/h	83	48.6		424	340	278	354	766	255	0	1310	85
Grp Sat Flow(s),veh/h/ln	1810	D		1774	1830	1509	1810	1695	1568	0	1647	1615
Q Serve(g_s), s	4.3			11.1	17.2	17.0	18.2	7.1	7.8	0.0	23.4	3.6
Cycle Q Clear(g_c), s	4.3			11.1	17.2	17.0	18.2	7.1	7.8	0.0	23.4	3.6
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	107			500	384	317	387	2938	906	0	1581	517
V/C Ratio(X)	0.78			0.85	0.89	0.88	0.92	0.26	0.28	0.00	0.83	0.16
Avail Cap(c_a), veh/h	380			2218	673	555	570	3697	1140	0	1816	594
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	44.2			39.9	36.5	36.4	36.6	10.0	10.1	0.0	29.9	23.2
Incr Delay (d2), s/veh	4.5			1.6	3.1	3.2	11.7	0.0	0.1	0.0	2.6	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3			5.5	9.0	7.4	10.3	3.3	3.4	0.0	10.9	1.6
LnGrp Delay(d),s/veh	48.6			41.5	39.6	39.6	48.3	10.0	10.2	0.0	32.5	23.3
LnGrp LOS	D			D	D	D	D	B	B		C	C
Approach Vol, veh/h					1042			1375			1395	
Approach Delay, s/veh					40.4			19.9			32.0	
Approach LOS					D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		60.7	17.8		24.5	36.2	9.7	24.8
Change Period (Y+Rc), s		5.7	4.4		* 4.2	5.7	4.1	4.8
Max Green Setting (Gmax), s		69.2	59.5		* 30	35.0	20.0	35.0
Max Q Clear Time (g_c+I1), s		9.8	13.1		20.2	25.4	6.3	19.2
Green Ext Time (p_c), s		8.5	0.3		0.1	5.1	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	492	281	50	107	0	335	0	742	90	432	550	426
Future Volume (veh/h)	492	281	50	107	0	335	0	742	90	432	550	426
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1827	1900	0	1900	0	1776	1900	1881	1845	1827
Adj Flow Rate, veh/h	507	290	52	110	0	345	0	765	93	445	567	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	4	0	0	0	0	7	0	1	3	4
Cap, veh/h	710	466	204	199	0	0	0	1433	379	585	1702	754
Arrive On Green	0.21	0.13	0.13	0.11	0.00	0.00	0.00	0.23	0.23	0.17	0.49	0.00
Sat Flow, veh/h	3442	3539	1553	1810	110		0	6357	1615	3476	3505	1553
Grp Volume(v), veh/h	507	290	52	110	21.8		0	765	93	445	567	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1553	1810	C		0	1527	1615	1738	1752	1553
Q Serve(g_s), s	6.8	3.8	1.5	2.9			0.0	5.4	2.3	6.0	4.9	0.0
Cycle Q Clear(g_c), s	6.8	3.8	1.5	2.9			0.0	5.4	2.3	6.0	4.9	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	710	466	204	199			0	1433	379	585	1702	754
V/C Ratio(X)	0.71	0.62	0.25	0.55			0.00	0.53	0.25	0.76	0.33	0.00
Avail Cap(c_a), veh/h	3474	2500	1097	1461			0	5549	1467	1754	5243	2323
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.3	20.3	19.3	20.9			0.0	16.6	15.4	19.6	7.8	0.0
Incr Delay (d2), s/veh	1.0	0.5	0.2	0.9			0.0	0.1	0.1	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	1.9	0.6	1.5			0.0	2.3	1.0	3.0	2.4	0.0
LnGrp Delay(d),s/veh	19.3	20.9	19.6	21.8			0.0	16.7	15.5	20.4	7.9	0.0
LnGrp LOS	B	C	B	C				B	B	C	A	
Approach Vol, veh/h		849						858			1012	
Approach Delay, s/veh		19.9						16.6			13.4	
Approach LOS		B						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	12.4	17.3	9.2	10.6		29.8	14.3	
Change Period (Y+Rc), s	4.1	5.7	3.7	4.1		5.7	4.1	
Max Green Setting (Gmax), s	25.0	45.0	40.0	35.0		74.1	50.0	
Max Q Clear Time (g_c+I1), s	8.0	7.4	4.9	5.8		6.9	8.8	
Green Ext Time (p_c), s	0.3	4.2	0.0	0.7		4.2	1.4	

Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Notes

HCM Unsignalized Intersection Capacity Analysis
11: Sierra College Blvd & Schriber Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	106	728	72	0	707
Future Volume (Veh/h)	0	106	728	72	0	707
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	110	758	75	0	736
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			443			404
pX, platoon unblocked	0.93	0.99			0.99	
vC, conflicting volume	1164	228			834	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899	142			757	
tC, single (s)	7.8	7.0			5.4	
tC, 2 stage (s)						
tF (s)	4.0	3.4			2.9	
p0 queue free %	100	87			100	
cM capacity (veh/h)	188	850			524	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2
Volume Total	110	217	217	217	183	368	368
Volume Left	0	0	0	0	0	0	0
Volume Right	110	0	0	0	75	0	0
cSH	850	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.13	0.13	0.13	0.11	0.22	0.22
Queue Length 95th (ft)	11	0	0	0	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.9	0.0				0.0	
Approach LOS	A						

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	70	1	18	1	779	77	31	670	5
Future Volume (veh/h)	3	0	3	70	1	18	1	779	77	31	670	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1827	1900	1900	1900	1863	1881	1727	1863	1900
Adj Flow Rate, veh/h	3	0	3	72	1	19	1	803	79	32	691	5
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	4	0	0	0	2	1	10	2	0
Cap, veh/h	7	0	7	208	117	99	3	2681	842	58	1986	906
Arrive On Green	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.53	0.53	0.04	0.56	0.56
Sat Flow, veh/h	1810	0	1615	3375	1900	1615	1810	5085	1597	1645	3539	1614
Grp Volume(v), veh/h	3	0	3	72	1	19	1	803	79	32	691	5
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1688	1900	1615	1810	1695	1597	1645	1770	1614
Q Serve(g_s), s	0.1	0.0	0.1	1.1	0.0	0.6	0.0	4.7	1.3	1.0	5.7	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	1.1	0.0	0.6	0.0	4.7	1.3	1.0	5.7	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	7	0	7	208	117	99	3	2681	842	58	1986	906
V/C Ratio(X)	0.41	0.00	0.46	0.35	0.01	0.19	0.29	0.30	0.09	0.55	0.35	0.01
Avail Cap(c_a), veh/h	1019	0	1213	1902	1427	1213	1019	5730	1800	1853	5982	2727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	26.5	24.0	23.5	23.7	26.6	7.1	6.3	25.3	6.4	5.1
Incr Delay (d2), s/veh	32.3	0.0	49.7	1.0	0.0	1.1	42.1	0.1	0.1	7.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.5	0.0	0.3	0.1	2.2	0.6	0.6	2.7	0.0
LnGrp Delay(d),s/veh	58.7	0.0	76.1	25.0	23.5	24.8	68.7	7.1	6.3	33.1	6.5	5.1
LnGrp LOS	E		E	C	C	C	E	A	A	C	A	A
Approach Vol, veh/h		6			92			883			728	
Approach Delay, s/veh		67.4			24.9			7.1			7.7	
Approach LOS		E			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	33.9	7.8	5.2	4.6	35.7	4.7	8.3
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	60.0	60.0	30.0	40.0	30.0	90.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	3.0	6.7	3.1	2.1	2.0	7.7	2.1	2.6
Green Ext Time (p_c), s	0.1	20.1	0.2	0.1	0.0	22.2	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	20	15	820	716	27
Future Volume (veh/h)	37	20	15	820	716	27
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1900	1863	1847	1900
Adj Flow Rate, veh/h	40	22	16	891	778	29
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	0	2	3	3
Cap, veh/h	201	95	36	2560	3029	113
Arrive On Green	0.06	0.06	0.02	0.72	0.61	0.61
Sat Flow, veh/h	3408	1615	1810	3632	5155	186
Grp Volume(v), veh/h	40	22	16	891	523	284
Grp Sat Flow(s),veh/h/ln	1704	1615	1810	1770	1680	1814
Q Serve(g_s), s	0.5	0.6	0.4	4.4	3.4	3.4
Cycle Q Clear(g_c), s	0.5	0.6	0.4	4.4	3.4	3.4
Prop In Lane	1.00	1.00	1.00			0.10
Lane Grp Cap(c), veh/h	201	95	36	2560	2040	1101
V/C Ratio(X)	0.20	0.23	0.44	0.35	0.26	0.26
Avail Cap(c_a), veh/h	2909	1379	1545	7893	4303	2322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	21.0	22.7	2.4	4.3	4.3
Incr Delay (d2), s/veh	0.5	1.2	8.2	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	0.3	2.1	1.5	1.7
LnGrp Delay(d),s/veh	21.5	22.2	30.9	2.5	4.4	4.4
LnGrp LOS	C	C	C	A	A	A
Approach Vol, veh/h	62			907	807	
Approach Delay, s/veh	21.7			3.0	4.4	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		7.3	5.4	34.1				39.6
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		40.0	40.0	60.0				104.5
Max Q Clear Time (g_c+I1), s		2.6	2.4	5.4				6.4
Green Ext Time (p_c), s		0.2	0.0	23.0				26.6

Intersection Summary	
HCM 2010 Ctrl Delay	4.3
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	184	185	40	158	120	165	584	29	110	490	101
Future Volume (veh/h)	137	184	185	40	158	120	165	584	29	110	490	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1881	1863	1840	1900	1827	1858	1900	1863	1863	1827
Adj Flow Rate, veh/h	143	192	193	42	165	125	172	608	30	115	510	105
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	1	2	5	5	4	2	2	2	2	4
Cap, veh/h	184	1007	450	68	424	299	303	1203	59	151	1763	527
Arrive On Green	0.10	0.28	0.28	0.04	0.22	0.22	0.09	0.35	0.35	0.08	0.35	0.35
Sat Flow, veh/h	1774	3539	1582	1774	1937	1366	3375	3424	169	1774	5085	1521
Grp Volume(v), veh/h	143	192	193	42	148	142	172	313	325	115	510	105
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1748	1555	1688	1766	1827	1774	1695	1521
Q Serve(g_s), s	6.2	3.2	7.8	1.8	5.7	6.2	3.9	11.0	11.1	5.0	5.7	3.8
Cycle Q Clear(g_c), s	6.2	3.2	7.8	1.8	5.7	6.2	3.9	11.0	11.1	5.0	5.7	3.8
Prop In Lane	1.00		1.00	1.00		0.88	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	184	1007	450	68	383	341	303	620	642	151	1763	527
V/C Ratio(X)	0.78	0.19	0.43	0.62	0.39	0.42	0.57	0.50	0.51	0.76	0.29	0.20
Avail Cap(c_a), veh/h	675	2245	1004	1013	1109	986	1713	672	695	675	2903	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	21.3	23.0	37.4	26.3	26.5	34.4	20.2	20.2	35.3	18.7	18.1
Incr Delay (d2), s/veh	6.9	0.3	2.3	8.9	0.9	1.2	3.6	2.3	2.2	7.8	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.6	3.7	1.1	2.8	2.8	1.9	5.8	6.0	2.8	2.7	1.6
LnGrp Delay(d),s/veh	41.3	21.7	25.3	46.3	27.2	27.6	38.0	22.5	22.4	43.1	18.8	18.3
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	B	B
Approach Vol, veh/h		528			332			810			730	
Approach Delay, s/veh		28.3			29.8			25.7			22.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	32.7	7.0	28.4	11.1	32.3	12.2	23.3
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	30.0	30.0	45.0	50.0	40.0	45.0	30.0	50.0
Max Q Clear Time (g_c+I1), s	7.0	13.1	3.8	9.8	5.9	7.7	8.2	8.2
Green Ext Time (p_c), s	0.3	11.5	0.1	9.0	1.4	19.2	0.4	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	23	21	8	10	26	18	358	13	21	454	63
Future Volume (veh/h)	43	23	21	8	10	26	18	358	13	21	454	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1743	1810	1900	1803	1900	1792	1808	1900	1597	1863	1863
Adj Flow Rate, veh/h	47	25	23	9	11	29	20	393	14	23	499	69
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	112	38	375	93	80	393	40	855	30	40	924	768
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.02	0.49	0.49	0.03	0.50	0.50
Sat Flow, veh/h	48	154	1535	21	327	1612	1707	1735	62	1521	1863	1549
Grp Volume(v), veh/h	72	0	23	20	0	29	20	0	407	23	499	69
Grp Sat Flow(s),veh/h/ln	202	0	1535	349	0	1612	1707	0	1797	1521	1863	1549
Q Serve(g_s), s	0.8	0.0	0.7	0.2	0.0	0.8	0.7	0.0	8.8	0.9	10.9	1.4
Cycle Q Clear(g_c), s	14.4	0.0	0.7	14.1	0.0	0.8	0.7	0.0	8.8	0.9	10.9	1.4
Prop In Lane	0.65		1.00	0.45		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	150	0	375	173	0	393	40	0	886	40	924	768
V/C Ratio(X)	0.48	0.00	0.06	0.12	0.00	0.07	0.50	0.00	0.46	0.58	0.54	0.09
Avail Cap(c_a), veh/h	520	0	779	579	0	818	866	0	1216	772	1576	1310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	17.1	18.2	0.0	17.2	28.5	0.0	9.8	28.5	10.3	7.9
Incr Delay (d2), s/veh	2.8	0.0	0.1	0.3	0.0	0.1	11.0	0.0	1.0	14.5	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.3	0.3	0.0	0.4	0.4	0.0	4.5	0.5	5.9	0.6
LnGrp Delay(d),s/veh	26.2	0.0	17.2	18.6	0.0	17.3	39.6	0.0	10.9	43.0	11.6	8.0
LnGrp LOS	C		B	B		B	D		B	D	B	A
Approach Vol, veh/h		95			49			427			591	
Approach Delay, s/veh		24.0			17.8			12.2			12.4	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	34.7		19.4	5.5	34.8		19.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	30.0	40.0		30.0	30.0	50.0		30.0
Max Q Clear Time (g_c+I1), s	2.9	10.8		16.4	2.7	12.9		16.1
Green Ext Time (p_c), s	0.0	14.7		0.6	0.0	16.7		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	51	19	369	67	101	14	466	329	81	400	40
Future Volume (veh/h)	44	51	19	369	67	101	14	466	329	81	400	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1853	1881	1900	1845	1881	1827	1858	1900
Adj Flow Rate, veh/h	47	54	20	444	0	107	15	496	350	86	426	43
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	6	1	0	3	1	4	2	2
Cap, veh/h	146	210	73	660	0	292	26	1429	651	113	1482	149
Arrive On Green	0.08	0.08	0.08	0.18	0.00	0.18	0.01	0.41	0.41	0.07	0.46	0.46
Sat Flow, veh/h	1810	2611	913	3583	0	1586	1810	3505	1597	1740	3232	325
Grp Volume(v), veh/h	47	36	38	444	0	107	15	496	350	86	232	237
Grp Sat Flow(s),veh/h/ln	1810	1805	1719	1792	0	1586	1810	1752	1597	1740	1765	1792
Q Serve(g_s), s	1.7	1.3	1.5	8.1	0.0	4.2	0.6	6.9	11.7	3.4	5.8	5.8
Cycle Q Clear(g_c), s	1.7	1.3	1.5	8.1	0.0	4.2	0.6	6.9	11.7	3.4	5.8	5.8
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	146	145	138	660	0	292	26	1429	651	113	809	821
V/C Ratio(X)	0.32	0.25	0.27	0.67	0.00	0.37	0.57	0.35	0.54	0.76	0.29	0.29
Avail Cap(c_a), veh/h	719	717	683	3050	0	1350	513	2983	1359	864	1502	1525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	30.4	30.5	26.8	0.0	25.2	34.5	14.4	15.8	32.4	11.9	11.9
Incr Delay (d2), s/veh	1.3	0.9	1.0	1.2	0.0	0.8	18.3	0.2	1.0	9.9	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.7	0.7	4.1	0.0	1.9	0.4	3.3	5.3	2.0	2.8	2.9
LnGrp Delay(d),s/veh	31.9	31.3	31.5	28.0	0.0	25.9	52.8	14.6	16.8	42.3	12.2	12.2
LnGrp LOS	C	C	C	C		C	D	B	B	D	B	B
Approach Vol, veh/h		121			551			861			555	
Approach Delay, s/veh		31.6			27.6			16.2			16.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.6	33.8		10.7	5.0	37.3		17.5
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	35.0	60.0		28.0	20.0	60.0		60.0
Max Q Clear Time (g_c+I1), s	5.4	13.7		3.7	2.6	7.8		10.1
Green Ext Time (p_c), s	0.2	15.0		0.5	0.0	15.5		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	395	14	22	389	417	43	15	22	375	24	194
Future Volume (veh/h)	191	395	14	22	389	417	43	15	22	375	24	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1846	1900	1881	1874	1863
Adj Flow Rate, veh/h	203	420	15	23	414	0	46	16	23	418	0	206
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	230	1224	44	31	848	368	533	202	290	630	0	277
Arrive On Green	0.13	0.35	0.35	0.02	0.24	0.00	0.29	0.29	0.29	0.18	0.00	0.18
Sat Flow, veh/h	1792	3521	126	1723	3574	1553	1810	684	983	3583	0	1573
Grp Volume(v), veh/h	203	213	222	23	414	0	46	0	39	418	0	206
Grp Sat Flow(s),veh/h/ln	1792	1788	1859	1723	1787	1553	1810	0	1667	1792	0	1573
Q Serve(g_s), s	13.2	10.5	10.5	1.6	11.9	0.0	2.2	0.0	2.0	12.9	0.0	14.8
Cycle Q Clear(g_c), s	13.2	10.5	10.5	1.6	11.9	0.0	2.2	0.0	2.0	12.9	0.0	14.8
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	230	621	646	31	848	368	533	0	491	630	0	277
V/C Ratio(X)	0.88	0.34	0.34	0.75	0.49	0.00	0.09	0.00	0.08	0.66	0.00	0.74
Avail Cap(c_a), veh/h	234	677	704	297	1354	588	533	0	491	1056	0	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.9	28.7	28.7	58.1	39.1	0.0	30.3	0.0	30.3	45.7	0.0	46.4
Incr Delay (d2), s/veh	30.0	1.2	1.1	29.4	1.6	0.0	0.3	0.0	0.3	1.7	0.0	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	5.3	5.6	1.0	6.1	0.0	1.1	0.0	1.0	6.5	0.0	6.8
LnGrp Delay(d),s/veh	80.9	29.9	29.9	87.4	40.7	0.0	30.6	0.0	30.6	47.4	0.0	52.0
LnGrp LOS	F	C	C	F	D		C		C	D		D
Approach Vol, veh/h		638			437			85			624	
Approach Delay, s/veh		46.1			43.1			30.6			48.9	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		40.0	6.6	46.3		25.9	19.7	33.2
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		35.0	20.5	45.0		35.0	15.5	45.0
Max Q Clear Time (g_c+I1), s		4.2	3.6	12.5		16.8	15.2	13.9
Green Ext Time (p_c), s		0.4	0.0	14.6		3.4	0.0	14.3

Intersection Summary	
HCM 2010 Ctrl Delay	45.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	466	412	377	706	0	0	0	0	29	2	170
Future Volume (veh/h)	0	466	412	377	706	0	0	0	0	29	2	170
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1845	1863	0				1827	1863	1900
Adj Flow Rate, veh/h	0	491	434	397	743	0				31	2	179
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	3	2	0				4	0	4
Cap, veh/h	0	1613	720	433	2699	0				241	2	217
Arrive On Green	0.00	0.46	0.46	0.25	0.76	0.00				0.14	0.14	0.14
Sat Flow, veh/h	0	3632	1580	1757	3632	0				1740	18	1569
Grp Volume(v), veh/h	0	491	434	397	743	0				31	0	181
Grp Sat Flow(s),veh/h/ln	0	1770	1580	1757	1770	0				1740	0	1586
Q Serve(g_s), s	0.0	8.2	19.2	20.5	5.9	0.0				1.5	0.0	10.3
Cycle Q Clear(g_c), s	0.0	8.2	19.2	20.5	5.9	0.0				1.5	0.0	10.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1613	720	433	2699	0				241	0	220
V/C Ratio(X)	0.00	0.30	0.60	0.92	0.28	0.00				0.13	0.00	0.82
Avail Cap(c_a), veh/h	0	1613	720	604	2699	0				486	0	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.87	0.87	0.82	0.82	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.0	19.0	34.1	3.3	0.0				35.1	0.0	39.0
Incr Delay (d2), s/veh	0.0	0.4	3.2	10.8	0.2	0.0				0.1	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	9.0	11.2	2.9	0.0				0.7	0.0	4.7
LnGrp Delay(d),s/veh	0.0	16.4	22.2	44.9	3.5	0.0				35.2	0.0	41.9
LnGrp LOS		B	C	D	A					D		D
Approach Vol, veh/h		925			1140						212	
Approach Delay, s/veh		19.1			17.9						40.9	
Approach LOS		B			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	28.5	47.5		17.0		76.0		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	32.0	20.4		26.0		58.0		
Max Q Clear Time (g_c+I1), s	22.5	21.2		12.3		7.9		
Green Ext Time (p_c), s	0.5	0.0		0.6		8.3		

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	349	0	0	610	73	473	3	370	0	0	0
Future Volume (veh/h)	146	349	0	0	610	73	473	3	370	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1850	1900	1845	1833	1827			
Adj Flow Rate, veh/h	162	388	0	0	678	81	655	0	275			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	1	1	0	0	3	3	3	33	4			
Cap, veh/h	196	2366	0	0	1631	195	863	0	381			
Arrive On Green	0.11	0.66	0.00	0.00	0.52	0.52	0.25	0.00	0.25			
Sat Flow, veh/h	1792	3668	0	0	3257	378	3514	0	1553			
Grp Volume(v), veh/h	162	388	0	0	376	383	655	0	275			
Grp Sat Flow(s),veh/h/ln	1792	1787	0	0	1758	1784	1757	0	1553			
Q Serve(g_s), s	8.3	3.9	0.0	0.0	12.4	12.4	16.3	0.0	15.3			
Cycle Q Clear(g_c), s	8.3	3.9	0.0	0.0	12.4	12.4	16.3	0.0	15.3			
Prop In Lane	1.00		0.00	0.00		0.21	1.00		1.00			
Lane Grp Cap(c), veh/h	196	2366	0	0	906	920	863	0	381			
V/C Ratio(X)	0.83	0.16	0.00	0.00	0.42	0.42	0.76	0.00	0.72			
Avail Cap(c_a), veh/h	286	2366	0	0	906	920	1234	0	545			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.95	0.95	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.0	6.0	0.0	0.0	14.0	14.0	32.9	0.0	32.5			
Incr Delay (d2), s/veh	7.9	0.1	0.0	0.0	1.3	1.3	2.3	0.0	3.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.6	1.9	0.0	0.0	6.3	6.4	8.2	0.0	7.0			
LnGrp Delay(d),s/veh	48.9	6.2	0.0	0.0	15.4	15.4	35.1	0.0	36.2			
LnGrp LOS	D	A			B	B	D		D			
Approach Vol, veh/h		550			759			930				
Approach Delay, s/veh		18.8			15.4			35.5				
Approach LOS		B			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		66.8			13.8	53.1		27.2
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		52.0			15.0	33.5		33.0
Max Q Clear Time (g_c+I1), s		5.9			10.3	14.4		18.3
Green Ext Time (p_c), s		5.7			0.1	5.0		4.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	552	84	16	592	0	91	0	20	0	0	0
Future Volume (veh/h)	59	552	84	16	592	0	91	0	20	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1865	1900	1900	1845	0	1900	0	1900			
Adj Flow Rate, veh/h	64	600	91	17	643	0	99	0	22			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	0	3	0	0	0	0			
Cap, veh/h	124	2011	304	30	2109	0	145	0	129			
Arrive On Green	0.07	0.65	0.65	0.02	0.60	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3076	465	1810	3597	0	1810	0	1615			
Grp Volume(v), veh/h	64	345	346	17	643	0	99	0	22			
Grp Sat Flow(s),veh/h/ln	1810	1772	1770	1810	1752	0	1810	0	1615			
Q Serve(g_s), s	1.8	4.5	4.6	0.5	4.8	0.0	2.9	0.0	0.7			
Cycle Q Clear(g_c), s	1.8	4.5	4.6	0.5	4.8	0.0	2.9	0.0	0.7			
Prop In Lane	1.00		0.26	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	124	1158	1157	30	2109	0	145	0	129			
V/C Ratio(X)	0.52	0.30	0.30	0.56	0.30	0.00	0.68	0.00	0.17			
Avail Cap(c_a), veh/h	837	1639	1637	837	3241	0	837	0	747			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.3	4.0	4.0	26.4	5.2	0.0	24.2	0.0	23.2			
Incr Delay (d2), s/veh	3.3	0.4	0.4	15.4	0.2	0.0	5.6	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.0	2.3	2.3	0.4	2.4	0.0	1.7	0.0	0.3			
LnGrp Delay(d),s/veh	27.6	4.4	4.4	41.8	5.5	0.0	29.8	0.0	23.8			
LnGrp LOS	C	A	A	D	A		C		C			
Approach Vol, veh/h		755			660			121				
Approach Delay, s/veh		6.4			6.4			28.7				
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.9	40.3			7.7	37.5		8.8
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	25.0	50.0			25.0	50.0		25.0
Max Q Clear Time (g_c+I1), s	2.5	6.6			3.8	6.8		4.9
Green Ext Time (p_c), s	0.0	25.8			0.1	25.7		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	788	898	0
Future Vol, veh/h	0	0	7	788	898	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	812	926	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	463	926	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	551	746	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	551	746	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	746	-	-	-	-
HCM Lane V/C Ratio	0.01	-	-	-	-
HCM Control Delay (s)	9.9	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	45	59	386	306	35
Future Vol, veh/h	42	45	59	386	306	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	2	1	9
Mvmt Flow	46	49	64	420	333	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	690	185	371	0	-	0
Stage 1	352	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	383	832	1163	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	362	832	1163	-	-	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	661	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1163	-	362	832	-	-
HCM Lane V/C Ratio	0.055	-	0.126	0.059	-	-
HCM Control Delay (s)	8.3	-	16.4	9.6	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	497	85	26	536	8	97	1	23	18	3	85
Future Volume (veh/h)	33	497	85	26	536	8	97	1	23	18	3	85
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1868	1900	1900	1863	1900	1900	1780	1900	1900	1900	1900
Adj Flow Rate, veh/h	35	523	89	27	564	8	102	1	24	19	3	89
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	70	1228	208	131	1639	23	153	5	124	125	20	128
Arrive On Green	0.04	0.40	0.40	0.07	0.46	0.46	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	1810	3037	515	1810	3574	51	1810	61	1462	1573	248	1615
Grp Volume(v), veh/h	35	305	307	27	279	293	102	0	25	22	0	89
Grp Sat Flow(s),veh/h/ln	1810	1775	1777	1810	1770	1854	1810	0	1522	1821	0	1615
Q Serve(g_s), s	1.0	6.2	6.2	0.7	5.1	5.1	2.7	0.0	0.8	0.6	0.0	2.7
Cycle Q Clear(g_c), s	1.0	6.2	6.2	0.7	5.1	5.1	2.7	0.0	0.8	0.6	0.0	2.7
Prop In Lane	1.00		0.29	1.00		0.03	1.00		0.96	0.86		1.00
Lane Grp Cap(c), veh/h	70	718	719	131	812	850	153	0	129	144	0	128
V/C Ratio(X)	0.50	0.42	0.43	0.21	0.34	0.34	0.66	0.00	0.19	0.15	0.00	0.70
Avail Cap(c_a), veh/h	1082	2123	2126	1082	2117	2218	1082	0	911	1089	0	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.6	10.7	10.8	21.9	8.7	8.7	22.3	0.0	21.4	21.5	0.0	22.5
Incr Delay (d2), s/veh	5.5	1.4	1.5	0.8	0.9	0.9	4.9	0.0	0.7	0.5	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.3	3.3	0.4	2.7	2.8	1.6	0.0	0.3	0.3	0.0	1.4
LnGrp Delay(d),s/veh	29.2	12.2	12.2	22.7	9.6	9.6	27.1	0.0	22.1	22.0	0.0	29.1
LnGrp LOS	C	B	B	C	A	A	C		C	C		C
Approach Vol, veh/h		647			599			127			111	
Approach Delay, s/veh		13.1			10.2			26.1			27.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.6	25.3		8.3	5.9	28.0		8.0
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	30.0	* 60		30.0	30.0	60.0		30.0
Max Q Clear Time (g_c+I1), s	2.7	8.2		4.7	3.0	7.1		4.7
Green Ext Time (p_c), s	8.9	12.0		0.4	0.1	11.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	499	229	562	528	221	677
Future Volume (veh/h)	499	229	562	528	221	677
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	542	249	611	574	240	736
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	759	349	1851	925	293	2168
Arrive On Green	0.22	0.22	0.36	0.36	0.17	0.61
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	542	249	611	574	240	736
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	7.9	7.8	4.7	12.7	7.0	5.5
Cycle Q Clear(g_c), s	7.9	7.8	4.7	12.7	7.0	5.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	759	349	1851	925	293	2168
V/C Ratio(X)	0.71	0.71	0.33	0.62	0.82	0.34
Avail Cap(c_a), veh/h	1150	529	1851	925	346	2168
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	19.4	12.4	7.3	21.7	5.1
Incr Delay (d2), s/veh	1.3	2.7	0.5	3.1	12.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	3.7	2.2	9.1	4.4	2.8
LnGrp Delay(d),s/veh	20.7	22.1	12.9	10.4	34.3	5.5
LnGrp LOS	C	C	B	B	C	A
Approach Vol, veh/h	791		1185			976
Approach Delay, s/veh	21.2		11.7			12.6
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.4	24.1				37.5		16.4
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	9.0	14.7				7.5		9.9
Green Ext Time (p_c), s	0.1	2.7				13.8		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	166	15	0	174	0	6
Future Vol, veh/h	166	15	0	174	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	180	16	0	189	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	188
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	854
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	854
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	854	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	9.2	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Intersection Delay, s/veh	21.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	195	205	300	174	4	236	3	108	3	2	11
Future Vol, veh/h	6	195	205	300	174	4	236	3	108	3	2	11
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	17	6	5	2	6	0	4	0	6	0	0	0
Mvmt Flow	7	241	253	370	215	5	291	4	133	4	2	14
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	16.6	26.1	21.2	11.9
HCM LOS	C	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	99%	0%	3%	0%	100%	0%	19%
Vol Thru, %	1%	0%	97%	0%	0%	98%	12%
Vol Right, %	0%	100%	0%	100%	0%	2%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	239	108	201	205	300	178	16
LT Vol	236	0	6	0	300	0	3
Through Vol	3	0	195	0	0	174	2
RT Vol	0	108	0	205	0	4	11
Lane Flow Rate	295	133	248	253	370	220	20
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.664	0.252	0.521	0.466	0.781	0.436	0.046
Departure Headway (Hd)	8.099	6.808	7.554	6.628	7.594	7.135	8.418
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	448	528	479	544	478	505	425
Service Time	5.832	4.54	5.292	4.365	5.331	4.872	6.473
HCM Lane V/C Ratio	0.658	0.252	0.518	0.465	0.774	0.436	0.047
HCM Control Delay	25.5	11.8	18.3	15	32.5	15.3	11.9
HCM Lane LOS	D	B	C	B	D	C	B
HCM 95th-tile Q	4.7	1	3	2.5	7	2.2	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	55	457	5	34	388
Future Vol, veh/h	10	55	457	5	34	388
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	3	0	12	4
Mvmt Flow	10	57	476	5	35	404

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	954	479	0	0	481	0
Stage 1	479	-	-	-	-	-
Stage 2	475	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.22	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.308	-
Pot Cap-1 Maneuver	289	591	-	-	1031	-
Stage 1	627	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	279	591	-	-	1031	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	609	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	504	1031	-
HCM Lane V/C Ratio	-	-	0.134	0.034	-
HCM Control Delay (s)	-	-	13.2	8.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	3	47	1	2	6	463	30	6	418	2
Future Vol, veh/h	1	3	3	47	1	2	6	463	30	6	418	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	4	8	0	4	50
Mvmt Flow	1	3	3	51	1	2	7	503	33	7	454	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	985	984	455	986	986	503	457	0	0	503	0	0
Stage 1	468	468	-	516	516	-	-	-	-	-	-	-
Stage 2	517	516	-	470	470	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	229	250	609	229	250	573	1114	-	-	1072	-	-
Stage 1	579	565	-	546	538	-	-	-	-	-	-	-
Stage 2	545	538	-	578	563	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	225	247	609	223	247	573	1114	-	-	1072	-	-
Mov Cap-2 Maneuver	225	247	-	223	247	-	-	-	-	-	-	-
Stage 1	575	561	-	543	535	-	-	-	-	-	-	-
Stage 2	538	535	-	568	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.2	25.4	0.1	0.1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	241	609	223	573	1072	-	-
HCM Lane V/C Ratio	0.006	-	-	0.018	0.005	0.234	0.004	0.006	-	-
HCM Control Delay (s)	8.3	-	-	20.2	10.9	26	11.3	8.4	-	-
HCM Lane LOS	A	-	-	C	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0.9	0	0	-	-

Intersection	
Intersection Delay, s/veh	16.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	29	118	57	11	4	95	133	37	7	128	57
Future Vol, veh/h	87	29	118	57	11	4	95	133	37	7	128	57
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles, %	3	0	1	2	0	0	0	2	5	0	3	4
Mvmt Flow	143	48	193	93	18	7	156	218	61	11	210	93
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	15.2	15.1	17.9	15.2
HCM LOS	C	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	75%	0%	79%	100%	0%	0%
Vol Thru, %	0%	78%	25%	0%	15%	0%	100%	0%
Vol Right, %	0%	22%	0%	100%	6%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	170	116	118	72	7	128	57
LT Vol	95	0	87	0	57	7	0	0
Through Vol	0	133	29	0	11	0	128	0
RT Vol	0	37	0	118	4	0	0	57
Lane Flow Rate	156	279	190	193	118	11	210	93
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.346	0.57	0.426	0.372	0.287	0.026	0.457	0.185
Departure Headway (Hd)	7.999	7.364	8.073	6.927	8.768	8.296	7.835	7.134
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	449	488	445	518	408	431	460	502
Service Time	5.76	5.124	5.836	4.689	6.546	6.061	5.6	4.899
HCM Lane V/C Ratio	0.347	0.572	0.427	0.373	0.289	0.026	0.457	0.185
HCM Control Delay	15	19.5	16.7	13.8	15.1	11.3	17.1	11.5
HCM Lane LOS	B	C	C	B	C	B	C	B
HCM 95th-tile Q	1.5	3.5	2.1	1.7	1.2	0.1	2.3	0.7

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	23	279	272	2
Future Vol, veh/h	1	11	23	279	272	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	4	3	2	0
Mvmt Flow	1	12	26	310	302	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	664	303	304	0	-	0
Stage 1	303	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	429	741	1246	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	710	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	420	741	1246	-	-	-
Mov Cap-2 Maneuver	420	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	695	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1246	-	697	-	-
HCM Lane V/C Ratio	0.021	-	0.019	-	-
HCM Control Delay (s)	8	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	125	177	31	124	159
Future Vol, veh/h	39	125	177	31	124	159
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	4	15	2	3
Mvmt Flow	42	136	192	34	135	173

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	651	209	0	0	226	0
Stage 1	209	-	-	-	-	-
Stage 2	442	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	436	836	-	-	1342	-
Stage 1	831	-	-	-	-	-
Stage 2	652	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	392	836	-	-	1342	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	831	-	-	-	-	-
Stage 2	586	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	3.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	659	1342	-
HCM Lane V/C Ratio	-	-	0.271	0.1	-
HCM Control Delay (s)	-	-	12.5	8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0.3	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	240	3	0	196
Future Vol, veh/h	1	1	240	3	0	196
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	2	2	500	6	0	408

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	911	503	0	0	506	0
Stage 1	503	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	307	573	-	-	1069	-
Stage 1	612	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	307	573	-	-	1069	-
Mov Cap-2 Maneuver	307	-	-	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	676	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	307	573	1069	-
HCM Lane V/C Ratio	-	-	0.007	0.004	-	-
HCM Control Delay (s)	-	-	16.8	11.3	0	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	29	0	13	2	230	35	13	184	0
Future Vol, veh/h	0	0	1	29	0	13	2	230	35	13	184	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	51	51	51	51	51	51	51	51	51	51	51	51
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	2	0
Mvmt Flow	0	0	2	57	0	25	4	451	69	25	361	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	918	939	361	906	905	485	361	0	0	520	0	0
Stage 1	412	412	-	493	493	-	-	-	-	-	-	-
Stage 2	506	527	-	413	412	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	254	266	688	259	278	586	1209	-	-	1056	-	-
Stage 1	621	598	-	562	550	-	-	-	-	-	-	-
Stage 2	552	532	-	620	598	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	238	259	688	253	271	586	1209	-	-	1056	-	-
Mov Cap-2 Maneuver	238	259	-	253	271	-	-	-	-	-	-	-
Stage 1	619	584	-	560	548	-	-	-	-	-	-	-
Stage 2	526	530	-	604	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	21	0.1	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1209	-	-	688	307	1056	-	-
HCM Lane V/C Ratio	0.003	-	-	0.003	0.268	0.024	-	-
HCM Control Delay (s)	8	-	-	10.2	21	8.5	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.1	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	17	250	69	7	207
Future Vol, veh/h	68	17	250	69	7	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	52	52	52	52	52	52
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	131	33	481	133	13	398

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	972	547	0	0	613	0
Stage 1	547	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	282	541	-	-	976	-
Stage 1	584	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	278	541	-	-	976	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	655	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	408	541	976	-
HCM Lane V/C Ratio	-	-	0.321	0.06	0.014	-
HCM Control Delay (s)	-	-	17.9	12.1	8.7	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.4	0.2	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	21	33	292	270	1
Future Vol, veh/h	0	21	33	292	270	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	55	55	55	55
Heavy Vehicles, %	0	12	10	1	1	0
Mvmt Flow	0	38	60	531	491	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1143	492	493	0	-	0
Stage 1	492	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.29	-	-	-
Pot Cap-1 Maneuver	223	557	1030	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	210	557	1030	-	-	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1030	-	557	-	-
HCM Lane V/C Ratio	0.058	-	0.069	-	-
HCM Control Delay (s)	8.7	-	11.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	149	9	2	19	111	481	5	5	565	8
Future Vol, veh/h	0	0	149	9	2	19	111	481	5	5	565	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	204	12	3	26	152	659	7	7	774	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	774	1754	1754	662	774	0	0	666	0	0
Stage 1	-	-	-	966	966	-	-	-	-	-	-	-
Stage 2	-	-	-	788	788	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	395	59	86	457	846	-	-	933	-	-
Stage 1	0	0	-	282	336	-	-	-	-	-	-	-
Stage 2	0	0	-	356	405	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	395	24	70	457	846	-	-	933	-	-
Mov Cap-2 Maneuver	-	-	-	24	70	-	-	-	-	-	-	-
Stage 1	-	-	-	231	276	-	-	-	-	-	-	-
Stage 2	-	-	-	171	402	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.5	121.4	1.9	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	846	-	-	395	67	933	-	-
HCM Lane V/C Ratio	0.18	-	-	0.517	0.613	0.007	-	-
HCM Control Delay (s)	10.2	-	-	23.5	121.4	8.9	-	-
HCM Lane LOS	B	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0.7	-	-	2.9	2.6	0	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	0	17	168	11	11
Future Vol, veh/h	5	0	17	168	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	0	18	183	12	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	5	0	225	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1616	-	763	1078
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	817	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1616	-	755	1078
Mov Cap-2 Maneuver	-	-	-	-	729	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	808	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	-	-	1616	-
HCM Lane V/C Ratio	0.027	-	-	0.011	-
HCM Control Delay (s)	9.3	-	-	7.3	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Project Driveway Option B

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	106	0	91	0	524	52	127	776	1
Future Volume (vph)	0	0	104	106	0	91	0	524	52	127	776	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1453	1770		1495		3406	1583	1736	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1453	1770		1495		3406	1583	1736	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	113	0	97	0	557	55	135	826	1
RTOR Reduction (vph)	0	0	101	0	0	70	0	0	30	0	0	0
Lane Group Flow (vph)	0	0	10	113	0	27	0	557	25	135	827	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			4.5	5.3		14.3		18.3	23.6	6.2	28.5	
Effective Green, g (s)			4.5	5.3		14.3		18.3	23.6	6.2	28.5	
Actuated g/C Ratio			0.09	0.10		0.27		0.35	0.45	0.12	0.54	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			125	179		408		1191	714	205	1928	
v/s Ratio Prot				c0.06				0.16	0.00	c0.08	c0.23	
v/s Ratio Perm			0.01			c0.02			0.01			
v/c Ratio			0.08	0.63		0.07		0.47	0.03	0.66	0.43	
Uniform Delay, d1			22.0	22.6		14.1		13.2	8.0	22.0	7.1	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.3	7.1		0.1		0.4	0.0	5.7	0.2	
Delay (s)			22.3	29.6		14.1		13.6	8.0	27.8	7.3	
Level of Service			C	C		B		B	A	C	A	
Approach Delay (s)		22.3			22.5			13.1			10.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	24	109	159	42	28	225	578	123	89	892	85
Future Volume (veh/h)	73	24	109	159	42	28	225	578	123	89	892	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1793	1900	1743	1845	1863
Adj Flow Rate, veh/h	76	25	114	166	44	29	234	602	128	93	929	89
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	7	9	3	2
Cap, veh/h	95	138	194	201	248	217	275	2014	421	118	1424	634
Arrive On Green	0.06	0.08	0.08	0.12	0.14	0.14	0.16	0.50	0.50	0.07	0.41	0.41
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	4058	848	1660	3505	1561
Grp Volume(v), veh/h	76	25	114	166	44	29	234	482	248	93	929	89
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1632	1643	1660	1752	1561
Q Serve(g_s), s	3.4	1.0	3.3	7.2	1.6	1.2	9.8	6.4	6.6	4.1	15.7	2.6
Cycle Q Clear(g_c), s	3.4	1.0	3.3	7.2	1.6	1.2	9.8	6.4	6.6	4.1	15.7	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	95	138	194	201	248	217	275	1619	815	118	1424	634
V/C Ratio(X)	0.80	0.18	0.59	0.83	0.18	0.13	0.85	0.30	0.30	0.79	0.65	0.14
Avail Cap(c_a), veh/h	237	711	1000	237	705	616	325	1619	815	289	1592	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	31.6	32.7	31.5	27.7	27.5	30.0	10.9	11.0	33.6	17.6	13.7
Incr Delay (d2), s/veh	13.8	0.6	2.8	18.2	0.3	0.3	16.7	0.2	0.4	10.9	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.5	1.2	4.3	0.8	0.5	5.9	2.9	3.1	2.2	7.9	1.2
LnGrp Delay(d),s/veh	48.0	32.2	35.5	49.7	28.0	27.8	46.7	11.2	11.4	44.6	18.9	14.0
LnGrp LOS	D	C	D	D	C	C	D	B	B	D	B	B
Approach Vol, veh/h		215			239			964			1111	
Approach Delay, s/veh		39.5			43.1			19.9			20.7	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	41.5	13.0	9.8	15.8	34.9	8.3	14.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	12.8	34.6	10.6	30.0	14.0	33.4	10.6	30.0
Max Q Clear Time (g_c+I1), s	6.1	8.6	9.2	5.3	11.8	17.7	5.4	3.6
Green Ext Time (p_c), s	0.1	20.8	0.1	0.9	0.2	12.1	0.1	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	576	981	4
Future Vol, veh/h	0	0	16	576	981	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	606	1033	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	518	1037	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	508	678	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	508	678	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	678	-	-	-	-
HCM Lane V/C Ratio	0.025	-	-	-	-
HCM Control Delay (s)	10.4	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	142	58	534	144	56	925
Future Volume (veh/h)	142	58	534	144	56	925
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	63	580	157	61	1005
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	380	175	2564	973	108	2383
Arrive On Green	0.11	0.11	0.50	0.50	0.06	0.67
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	154	63	580	157	61	1005
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	1.7	1.5	2.7	1.8	1.4	5.4
Cycle Q Clear(g_c), s	1.7	1.5	2.7	1.8	1.4	5.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	380	175	2564	973	108	2383
V/C Ratio(X)	0.41	0.36	0.23	0.16	0.57	0.42
Avail Cap(c_a), veh/h	1489	685	2564	973	235	2383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	17.1	5.8	3.4	19.0	3.1
Incr Delay (d2), s/veh	0.7	1.2	0.2	0.4	4.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.7	1.3	1.1	0.8	2.7
LnGrp Delay(d),s/veh	17.9	18.4	6.0	3.8	23.6	3.7
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	217		737			1066
Approach Delay, s/veh	18.1		5.5			4.8
Approach LOS	B		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.0	25.5				32.5		9.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	5.5	18.0				28.0		18.0
Max Q Clear Time (g_c+I1), s	3.4	4.7				7.4		3.7
Green Ext Time (p_c), s	0.0	9.0				12.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	179	0	0	197	0	0
Future Vol, veh/h	179	0	0	197	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	195	0	0	214	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	195
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	846
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	846
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	118	0	106	0	984	119	106	802	0
Future Volume (vph)	0	0	142	118	0	106	0	984	119	106	802	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1599	1770		1553		3539	1615	1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1599	1770		1553		3539	1615	1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	123	0	110	0	1025	124	110	835	0
RTOR Reduction (vph)	0	0	126	0	0	82	0	0	59	0	0	0
Lane Group Flow (vph)	0	0	22	123	0	28	0	1025	65	110	835	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			7.1	5.2		16.8		28.7	33.9	6.1	38.8	
Effective Green, g (s)			7.1	5.2		16.8		28.7	33.9	6.1	38.8	
Actuated g/C Ratio			0.11	0.08		0.26		0.44	0.52	0.09	0.60	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			174	141		400		1560	840	167	2109	
v/s Ratio Prot				c0.07				c0.29	0.01	c0.06	0.24	
v/s Ratio Perm			c0.01			0.02			0.03			
v/c Ratio			0.13	0.87		0.07		0.66	0.08	0.66	0.40	
Uniform Delay, d1			26.2	29.6		18.3		14.3	7.8	28.5	7.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.3	40.5		0.1		1.1	0.0	7.0	0.2	
Delay (s)			26.5	70.1		18.4		15.4	7.8	35.5	7.1	
Level of Service			C	E		B		B	A	D	A	
Approach Delay (s)		26.5			45.7			14.6			10.4	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	28	288	137	26	33	218	1114	98	61	1149	87
Future Volume (veh/h)	174	28	288	137	26	33	218	1114	98	61	1149	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1900	1863	1863	1881
Adj Flow Rate, veh/h	185	30	306	146	28	35	232	1185	104	65	1222	93
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	219	267	400	179	231	193	266	2475	217	84	1461	651
Arrive On Green	0.12	0.15	0.15	0.10	0.13	0.13	0.15	0.52	0.52	0.05	0.41	0.41
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	4761	418	1774	3539	1577
Grp Volume(v), veh/h	185	30	306	146	28	35	232	844	445	65	1222	93
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1695	1789	1774	1770	1577
Q Serve(g_s), s	9.2	1.3	9.9	7.5	1.2	1.9	12.1	14.6	14.6	3.3	28.5	3.4
Cycle Q Clear(g_c), s	9.2	1.3	9.9	7.5	1.2	1.9	12.1	14.6	14.6	3.3	28.5	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	219	267	400	179	231	193	266	1762	930	84	1461	651
V/C Ratio(X)	0.84	0.11	0.77	0.82	0.12	0.18	0.87	0.48	0.48	0.77	0.84	0.14
Avail Cap(c_a), veh/h	240	597	893	233	597	498	300	1762	930	189	1533	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	34.0	37.7	40.4	35.6	35.9	38.0	14.1	14.1	43.3	24.2	16.8
Incr Delay (d2), s/veh	21.5	0.2	3.1	15.7	0.2	0.4	21.6	0.4	0.8	14.0	4.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.7	3.9	4.4	0.6	0.8	7.3	6.9	7.4	2.0	14.7	1.5
LnGrp Delay(d),s/veh	61.1	34.2	40.8	56.1	35.8	36.3	59.6	14.5	14.9	57.3	28.8	17.0
LnGrp LOS	E	C	D	E	D	D	E	B	B	E	C	B
Approach Vol, veh/h		521			209			1521			1380	
Approach Delay, s/veh		47.6			50.1			21.5			29.4	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	52.7	13.3	17.4	18.2	42.9	15.1	15.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	9.8	46.0	12.2	30.0	16.0	39.8	12.2	30.0
Max Q Clear Time (g_c+I1), s	5.3	16.6	9.5	11.9	14.1	30.5	11.2	3.9
Green Ext Time (p_c), s	0.0	27.8	0.1	1.5	0.1	7.5	0.1	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	29.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1103	1061	2
Future Vol, veh/h	0	20	5	1103	1061	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1137	1094	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	548	1096	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	473	644	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	473	644	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	644	-	473	-	-
HCM Lane V/C Ratio	0.008	-	0.044	-	-
HCM Control Delay (s)	10.6	-	13	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	370	167	947	356	148	933
Future Volume (veh/h)	370	167	947	356	148	933
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	402	182	1029	387	161	1014
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	618	284	2240	982	206	2282
Arrive On Green	0.18	0.18	0.44	0.44	0.12	0.64
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	402	182	1029	387	161	1014
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	5.6	5.5	7.3	6.3	4.5	7.3
Cycle Q Clear(g_c), s	5.6	5.5	7.3	6.3	4.5	7.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	618	284	2240	982	206	2282
V/C Ratio(X)	0.65	0.64	0.46	0.39	0.78	0.44
Avail Cap(c_a), veh/h	1210	557	2240	982	329	2282
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	19.5	10.0	4.9	22.0	4.5
Incr Delay (d2), s/veh	1.2	2.4	0.7	1.2	6.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.6	3.5	4.3	2.6	3.7
LnGrp Delay(d),s/veh	20.7	21.9	10.7	6.1	28.3	5.2
LnGrp LOS	C	C	B	A	C	A
Approach Vol, veh/h	584		1416			1175
Approach Delay, s/veh	21.0		9.5			8.3
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.5	27.0				37.5		13.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	9.5	19.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	6.5	9.3				9.3		7.6
Green Ext Time (p_c), s	0.1	8.3				17.6		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	218	7	0	224	0	3
Future Vol, veh/h	218	7	0	224	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	237	8	0	243	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	241
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	798
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	798
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	798	-	-	-
HCM Lane V/C Ratio	0.004	-	-	-
HCM Control Delay (s)	9.5	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	125	0	55	0	705	95	91	716	0
Future Volume (vph)	0	0	69	125	0	55	0	705	95	91	716	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1590	1805		1455		3505	1599	1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1590	1805		1455		3505	1599	1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	130	0	57	0	734	99	95	746	0
RTOR Reduction (vph)	0	0	68	0	0	44	0	0	48	0	0	0
Lane Group Flow (vph)	0	0	4	130	0	13	0	734	51	95	746	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			2.9	5.2		12.6		23.1	28.3	5.4	32.5	
Effective Green, g (s)			2.9	5.2		12.6		23.1	28.3	5.4	32.5	
Actuated g/C Ratio			0.05	0.10		0.23		0.42	0.52	0.10	0.60	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			84	171		335		1482	828	173	2106	
v/s Ratio Prot				c0.07				c0.21	0.01	c0.05	0.21	
v/s Ratio Perm			0.00			c0.01			0.03			
v/c Ratio			0.05	0.76		0.04		0.50	0.06	0.55	0.35	
Uniform Delay, d1			24.5	24.1		16.3		11.5	6.5	23.4	5.7	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2	17.9		0.1		0.4	0.0	1.9	0.1	
Delay (s)			24.8	42.0		16.4		11.9	6.6	25.3	5.8	
Level of Service			C	D		B		B	A	C	A	
Approach Delay (s)		24.8			34.2			11.2			8.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	27	204	174	28	23	198	825	157	64	943	112
Future Volume (veh/h)	131	27	204	174	28	23	198	825	157	64	943	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1866	1900	1845	1863	1881
Adj Flow Rate, veh/h	136	28	212	181	29	24	206	859	164	67	982	117
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	1
Cap, veh/h	170	207	315	219	247	226	245	2126	404	86	1425	635
Arrive On Green	0.10	0.11	0.11	0.12	0.14	0.14	0.14	0.49	0.49	0.05	0.40	0.40
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4300	816	1757	3539	1577
Grp Volume(v), veh/h	136	28	212	181	29	24	206	677	346	67	982	117
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1698	1721	1757	1770	1577
Q Serve(g_s), s	5.9	1.1	5.7	7.8	1.1	1.0	9.0	9.8	9.9	2.9	17.8	3.7
Cycle Q Clear(g_c), s	5.9	1.1	5.7	7.8	1.1	1.0	9.0	9.8	9.9	2.9	17.8	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	170	207	315	219	247	226	245	1679	851	86	1425	635
V/C Ratio(X)	0.80	0.14	0.67	0.83	0.12	0.11	0.84	0.40	0.41	0.78	0.69	0.18
Avail Cap(c_a), veh/h	231	705	1075	258	704	646	291	1679	851	217	1530	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	31.0	33.1	33.2	29.2	29.2	32.5	12.4	12.4	36.6	19.2	15.0
Incr Delay (d2), s/veh	13.2	0.3	2.5	17.1	0.2	0.2	16.9	0.3	0.7	14.0	1.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.6	2.3	4.8	0.6	0.5	5.4	4.6	4.8	1.7	8.9	1.7
LnGrp Delay(d),s/veh	47.5	31.3	35.6	50.3	29.4	29.4	49.5	12.7	13.1	50.6	20.9	15.3
LnGrp LOS	D	C	D	D	C	C	D	B	B	D	C	B
Approach Vol, veh/h		376			234			1229			1166	
Approach Delay, s/veh		39.6			45.6			19.0			22.0	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	43.4	13.7	12.8	15.0	36.3	11.6	14.9
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	9.6	37.0	11.4	30.0	13.0	33.6	10.3	31.1
Max Q Clear Time (g_c+I1), s	4.9	11.9	9.8	7.7	11.0	19.8	7.9	3.1
Green Ext Time (p_c), s	0.0	22.3	0.1	1.2	0.1	11.5	0.1	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	800	910	0
Future Vol, veh/h	0	0	7	800	910	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	825	938	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	469	938	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	546	739	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	546	739	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	739	-	-	-	-
HCM Lane V/C Ratio	0.01	-	-	-	-
HCM Control Delay (s)	9.9	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	439	241	562	465	233	677
Future Volume (veh/h)	439	241	562	465	233	677
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	477	262	611	505	253	736
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	728	335	2076	981	308	2303
Arrive On Green	0.21	0.21	0.41	0.41	0.17	0.65
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	477	262	611	505	253	736
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	8.3	10.2	5.3	11.6	9.0	6.0
Cycle Q Clear(g_c), s	8.3	10.2	5.3	11.6	9.0	6.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	728	335	2076	981	308	2303
V/C Ratio(X)	0.66	0.78	0.29	0.51	0.82	0.32
Avail Cap(c_a), veh/h	975	448	2076	981	530	2303
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.6	24.3	13.0	6.9	26.0	5.0
Incr Delay (d2), s/veh	1.0	6.3	0.4	1.9	5.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	5.1	2.5	8.4	4.8	3.0
LnGrp Delay(d),s/veh	24.6	30.6	13.4	8.9	31.5	5.4
LnGrp LOS	C	C	B	A	C	A
Approach Vol, veh/h	739		1116			989
Approach Delay, s/veh	26.7		11.3			12.1
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	15.8	31.2				47.0		18.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	19.5	18.5				42.5		18.5
Max Q Clear Time (g_c+I1), s	11.0	13.6				8.0		12.2
Green Ext Time (p_c), s	0.5	3.8				15.5		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	172	15	0	180	0	6
Future Vol, veh/h	172	15	0	180	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	187	16	0	196	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	195
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	846
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	846
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	846	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	9.3	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Project Driveway Option C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	104	0	93	0	522	50	127	776	1
Future Volume (vph)	0	0	104	104	0	93	0	522	50	127	776	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1448	1770		1495		3406	1583	1736	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1448	1770		1495		3406	1583	1736	3539	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	111	0	99	0	555	53	135	826	1
RTOR Reduction (vph)	0	0	105	0	0	74	0	0	27	0	0	0
Lane Group Flow (vph)	0	0	6	111	0	25	0	555	26	135	827	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			3.0	5.5		13.0		19.9	25.4	5.2	29.1	
Effective Green, g (s)			3.0	5.5		13.0		19.9	25.4	5.2	29.1	
Actuated g/C Ratio			0.06	0.11		0.25		0.39	0.49	0.10	0.56	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			84	188		376		1313	779	174	1995	
v/s Ratio Prot				c0.06				0.16	0.00	c0.08	c0.23	
v/s Ratio Perm			0.00			c0.02			0.01			
v/c Ratio			0.08	0.59		0.07		0.42	0.03	0.78	0.41	
Uniform Delay, d1			23.0	22.0		14.7		11.6	6.8	22.6	6.4	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.4	4.9		0.1		0.3	0.0	17.7	0.2	
Delay (s)			23.4	26.9		14.8		11.9	6.8	40.3	6.6	
Level of Service			C	C		B		B	A	D	A	
Approach Delay (s)		23.4			21.2			11.5			11.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	24	109	159	42	28	225	578	123	89	892	85
Future Volume (veh/h)	73	24	109	159	42	28	225	578	123	89	892	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1793	1900	1743	1845	1863
Adj Flow Rate, veh/h	76	25	114	166	44	29	234	602	128	93	929	89
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	7	9	3	2
Cap, veh/h	95	138	194	201	248	217	275	2014	421	118	1424	634
Arrive On Green	0.06	0.08	0.08	0.12	0.14	0.14	0.16	0.50	0.50	0.07	0.41	0.41
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	4058	848	1660	3505	1561
Grp Volume(v), veh/h	76	25	114	166	44	29	234	482	248	93	929	89
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1632	1643	1660	1752	1561
Q Serve(g_s), s	3.4	1.0	3.3	7.2	1.6	1.2	9.8	6.4	6.6	4.1	15.7	2.6
Cycle Q Clear(g_c), s	3.4	1.0	3.3	7.2	1.6	1.2	9.8	6.4	6.6	4.1	15.7	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	95	138	194	201	248	217	275	1619	815	118	1424	634
V/C Ratio(X)	0.80	0.18	0.59	0.83	0.18	0.13	0.85	0.30	0.30	0.79	0.65	0.14
Avail Cap(c_a), veh/h	237	711	1000	237	705	616	325	1619	815	289	1592	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	31.6	32.7	31.5	27.7	27.5	30.0	10.9	11.0	33.6	17.6	13.7
Incr Delay (d2), s/veh	13.8	0.6	2.8	18.2	0.3	0.3	16.7	0.2	0.4	10.9	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.5	1.2	4.3	0.8	0.5	5.9	2.9	3.1	2.2	7.9	1.2
LnGrp Delay(d),s/veh	48.0	32.2	35.5	49.7	28.0	27.8	46.7	11.2	11.4	44.6	18.9	14.0
LnGrp LOS	D	C	D	D	C	C	D	B	B	D	B	B
Approach Vol, veh/h		215			239			964			1111	
Approach Delay, s/veh		39.5			43.1			19.9			20.7	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	41.5	13.0	9.8	15.8	34.9	8.3	14.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	12.8	34.6	10.6	30.0	14.0	33.4	10.6	30.0
Max Q Clear Time (g_c+I1), s	6.1	8.6	9.2	5.3	11.8	17.7	5.4	3.6
Green Ext Time (p_c), s	0.1	20.8	0.1	0.9	0.2	12.1	0.1	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	572	979	4
Future Vol, veh/h	0	0	16	572	979	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	602	1031	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	518	1035	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	508	679	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	508	679	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	679	-	-	-	-
HCM Lane V/C Ratio	0.025	-	-	-	-
HCM Control Delay (s)	10.4	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	142	54	534	144	54	925
Future Volume (veh/h)	142	54	534	144	54	925
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	59	580	157	59	1005
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	379	174	2572	975	105	2384
Arrive On Green	0.11	0.11	0.51	0.51	0.06	0.67
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	154	59	580	157	59	1005
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	1.7	1.4	2.6	1.8	1.3	5.4
Cycle Q Clear(g_c), s	1.7	1.4	2.6	1.8	1.3	5.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	379	174	2572	975	105	2384
V/C Ratio(X)	0.41	0.34	0.23	0.16	0.56	0.42
Avail Cap(c_a), veh/h	1490	686	2572	975	235	2384
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	17.1	5.7	3.4	19.0	3.1
Incr Delay (d2), s/veh	0.7	1.1	0.2	0.4	4.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.7	1.3	1.1	0.8	2.7
LnGrp Delay(d),s/veh	17.9	18.2	5.9	3.8	23.6	3.6
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	213		737			1064
Approach Delay, s/veh	18.0		5.5			4.8
Approach LOS	B		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.0	25.5				32.5		9.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	5.5	18.0				28.0		18.0
Max Q Clear Time (g_c+I1), s	3.3	4.6				7.4		3.7
Green Ext Time (p_c), s	0.0	9.0				12.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.4
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	177	0	0	197	0	0
Future Vol, veh/h	177	0	0	197	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	0	0	214	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	192
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	850
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	850
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	177	1	3	195	5	4
Future Vol, veh/h	177	1	3	195	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	192	1	3	212	5	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	193	0	411	193
Stage 1	-	-	-	-	193	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1380	-	597	849
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1380	-	596	849
Mov Cap-2 Maneuver	-	-	-	-	650	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	726	-	-	1380	-
HCM Lane V/C Ratio	0.013	-	-	0.002	-
HCM Control Delay (s)	10	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	112	0	109	0	981	116	106	802	0
Future Volume (vph)	0	0	142	112	0	109	0	981	116	106	802	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1589	1770		1553		3539	1615	1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1589	1770		1553		3539	1615	1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	117	0	114	0	1022	121	110	835	0
RTOR Reduction (vph)	0	0	141	0	0	88	0	0	53	0	0	0
Lane Group Flow (vph)	0	0	7	117	0	26	0	1022	68	110	835	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			2.9	5.5		12.9		26.8	32.3	4.3	35.1	
Effective Green, g (s)			2.9	5.5		12.9		26.8	32.3	4.3	35.1	
Actuated g/C Ratio			0.05	0.10		0.22		0.47	0.56	0.07	0.61	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			80	169		348		1649	907	133	2160	
v/s Ratio Prot				c0.07				c0.29	0.01	c0.06	0.24	
v/s Ratio Perm			0.00			c0.02			0.03			
v/c Ratio			0.09	0.69		0.07		0.62	0.07	0.83	0.39	
Uniform Delay, d1			26.0	25.2		17.6		11.5	5.8	26.2	5.7	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.5	11.6		0.1		0.8	0.0	31.2	0.2	
Delay (s)			26.6	36.8		17.7		12.3	5.8	57.5	5.9	
Level of Service			C	D		B		B	A	E	A	
Approach Delay (s)		26.6			27.4			11.6			11.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	28	288	137	26	33	218	1114	98	61	1149	87
Future Volume (veh/h)	174	28	288	137	26	33	218	1114	98	61	1149	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1900	1863	1863	1881
Adj Flow Rate, veh/h	185	30	306	146	28	35	232	1185	104	65	1222	93
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	219	267	400	179	231	193	266	2475	217	84	1461	651
Arrive On Green	0.12	0.15	0.15	0.10	0.13	0.13	0.15	0.52	0.52	0.05	0.41	0.41
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	4761	418	1774	3539	1577
Grp Volume(v), veh/h	185	30	306	146	28	35	232	844	445	65	1222	93
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1695	1789	1774	1770	1577
Q Serve(g_s), s	9.2	1.3	9.9	7.5	1.2	1.9	12.1	14.6	14.6	3.3	28.5	3.4
Cycle Q Clear(g_c), s	9.2	1.3	9.9	7.5	1.2	1.9	12.1	14.6	14.6	3.3	28.5	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	219	267	400	179	231	193	266	1762	930	84	1461	651
V/C Ratio(X)	0.84	0.11	0.77	0.82	0.12	0.18	0.87	0.48	0.48	0.77	0.84	0.14
Avail Cap(c_a), veh/h	240	597	893	233	597	498	300	1762	930	189	1533	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	34.0	37.7	40.4	35.6	35.9	38.0	14.1	14.1	43.3	24.2	16.8
Incr Delay (d2), s/veh	21.5	0.2	3.1	15.7	0.2	0.4	21.6	0.4	0.8	14.0	4.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.7	3.9	4.4	0.6	0.8	7.3	6.9	7.4	2.0	14.7	1.5
LnGrp Delay(d),s/veh	61.1	34.2	40.8	56.1	35.8	36.3	59.6	14.5	14.9	57.3	28.8	17.0
LnGrp LOS	E	C	D	E	D	D	E	B	B	E	C	B
Approach Vol, veh/h		521			209			1521			1380	
Approach Delay, s/veh		47.6			50.1			21.5			29.4	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	52.7	13.3	17.4	18.2	42.9	15.1	15.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	9.8	46.0	12.2	30.0	16.0	39.8	12.2	30.0
Max Q Clear Time (g_c+I1), s	5.3	16.6	9.5	11.9	14.1	30.5	11.2	3.9
Green Ext Time (p_c), s	0.0	27.8	0.1	1.5	0.1	7.5	0.1	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	29.9
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1097	1055	2
Future Vol, veh/h	0	20	5	1097	1055	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1131	1088	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	545	1090	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	475	648	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	475	648	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	648	-	475	-	-
HCM Lane V/C Ratio	0.008	-	0.043	-	-
HCM Control Delay (s)	10.6	-	12.9	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	370	161	947	356	142	933
Future Volume (veh/h)	370	161	947	356	142	933
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	402	175	1029	387	154	1014
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	616	284	2263	988	199	2283
Arrive On Green	0.18	0.18	0.44	0.44	0.11	0.64
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	402	175	1029	387	154	1014
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	5.6	5.2	7.2	6.2	4.3	7.3
Cycle Q Clear(g_c), s	5.6	5.2	7.2	6.2	4.3	7.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	616	284	2263	988	199	2283
V/C Ratio(X)	0.65	0.62	0.45	0.39	0.77	0.44
Avail Cap(c_a), veh/h	1211	557	2263	988	364	2283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	19.4	9.9	4.8	22.1	4.5
Incr Delay (d2), s/veh	1.2	2.2	0.7	1.2	6.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.5	3.5	4.3	2.4	3.7
LnGrp Delay(d),s/veh	20.7	21.6	10.5	6.0	28.4	5.1
LnGrp LOS	C	C	B	A	C	A
Approach Vol, veh/h	577		1416			1168
Approach Delay, s/veh	21.0		9.3			8.2
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.2	27.3				37.5		13.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	6.3	9.2				9.3		7.6
Green Ext Time (p_c), s	0.1	7.6				17.6		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	215	7	0	221	0	3
Future Vol, veh/h	215	7	0	221	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	234	8	0	240	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	238
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	801
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	801
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	801	-	-	-
HCM Lane V/C Ratio	0.004	-	-	-
HCM Control Delay (s)	9.5	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	218	5	11	218	6	6
Future Vol, veh/h	218	5	11	218	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	237	5	12	237	7	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	242	0	501	240
Stage 1	-	-	-	-	240	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1324	-	530	799
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1324	-	525	799
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	776	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	685	-	-	1324	-
HCM Lane V/C Ratio	0.019	-	-	0.009	-
HCM Control Delay (s)	10.4	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	113	0	61	0	699	89	91	716	0
Future Volume (vph)	0	0	69	113	0	61	0	699	89	91	716	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95	1.00	1.00	0.95	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1585	1805		1455		3505	1599	1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1585	1805		1455		3505	1599	1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	118	0	64	0	728	93	95	746	0
RTOR Reduction (vph)	0	0	69	0	0	48	0	0	45	0	0	0
Lane Group Flow (vph)	0	0	3	118	0	16	0	728	48	95	746	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			2.0	5.1		11.6		19.5	24.6	2.6	26.1	
Effective Green, g (s)			2.0	5.1		11.6		19.5	24.6	2.6	26.1	
Actuated g/C Ratio			0.04	0.11		0.25		0.41	0.52	0.06	0.55	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			67	195		357		1448	833	96	1956	
v/s Ratio Prot				c0.07				c0.21	0.01	c0.05	0.21	
v/s Ratio Perm			0.00			c0.01			0.02			
v/c Ratio			0.05	0.61		0.04		0.50	0.06	0.99	0.38	
Uniform Delay, d1			21.7	20.1		13.6		10.3	5.6	22.3	6.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.3	5.2		0.1		0.4	0.0	87.4	0.2	
Delay (s)			22.0	25.3		13.6		10.6	5.6	109.7	6.1	
Level of Service			C	C		B		B	A	F	A	
Approach Delay (s)		22.0			21.2			10.1			17.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	27	204	174	28	23	198	825	157	64	943	112
Future Volume (veh/h)	131	27	204	174	28	23	198	825	157	64	943	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1866	1900	1845	1863	1881
Adj Flow Rate, veh/h	136	28	212	181	29	24	206	859	164	67	982	117
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	1
Cap, veh/h	170	207	315	219	247	226	245	2126	404	86	1425	635
Arrive On Green	0.10	0.11	0.11	0.12	0.14	0.14	0.14	0.49	0.49	0.05	0.40	0.40
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4300	816	1757	3539	1577
Grp Volume(v), veh/h	136	28	212	181	29	24	206	677	346	67	982	117
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1698	1721	1757	1770	1577
Q Serve(g_s), s	5.9	1.1	5.7	7.8	1.1	1.0	9.0	9.8	9.9	2.9	17.8	3.7
Cycle Q Clear(g_c), s	5.9	1.1	5.7	7.8	1.1	1.0	9.0	9.8	9.9	2.9	17.8	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	170	207	315	219	247	226	245	1679	851	86	1425	635
V/C Ratio(X)	0.80	0.14	0.67	0.83	0.12	0.11	0.84	0.40	0.41	0.78	0.69	0.18
Avail Cap(c_a), veh/h	231	705	1075	258	704	646	291	1679	851	217	1530	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	31.0	33.1	33.2	29.2	29.2	32.5	12.4	12.4	36.6	19.2	15.0
Incr Delay (d2), s/veh	13.2	0.3	2.5	17.1	0.2	0.2	16.9	0.3	0.7	14.0	1.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.6	2.3	4.8	0.6	0.5	5.4	4.6	4.8	1.7	8.9	1.7
LnGrp Delay(d),s/veh	47.5	31.3	35.6	50.3	29.4	29.4	49.5	12.7	13.1	50.6	20.9	15.3
LnGrp LOS	D	C	D	D	C	C	D	B	B	D	C	B
Approach Vol, veh/h		376			234			1229			1166	
Approach Delay, s/veh		39.6			45.6			19.0			22.0	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	43.4	13.7	12.8	15.0	36.3	11.6	14.9
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	9.6	37.0	11.4	30.0	13.0	33.6	10.3	31.1
Max Q Clear Time (g_c+I1), s	4.9	11.9	9.8	7.7	11.0	19.8	7.9	3.1
Green Ext Time (p_c), s	0.0	22.3	0.1	1.2	0.1	11.5	0.1	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	788	898	0
Future Vol, veh/h	0	0	7	788	898	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	812	926	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	463	926	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	551	746	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	551	746	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	746	-	-	-	-
HCM Lane V/C Ratio	0.01	-	-	-	-
HCM Control Delay (s)	9.9	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	439	229	562	465	221	677
Future Volume (veh/h)	439	229	562	465	221	677
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	477	249	611	505	240	736
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	749	345	1860	924	293	2176
Arrive On Green	0.22	0.22	0.37	0.37	0.17	0.61
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	477	249	611	505	240	736
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	6.8	7.8	4.6	10.5	7.0	5.4
Cycle Q Clear(g_c), s	6.8	7.8	4.6	10.5	7.0	5.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	749	345	1860	924	293	2176
V/C Ratio(X)	0.64	0.72	0.33	0.55	0.82	0.34
Avail Cap(c_a), veh/h	1154	531	1860	924	347	2176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	19.5	12.3	6.8	21.6	5.0
Incr Delay (d2), s/veh	0.9	2.9	0.5	2.3	12.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	3.7	2.2	7.5	4.4	2.7
LnGrp Delay(d),s/veh	20.0	22.4	12.7	9.2	34.1	5.5
LnGrp LOS	B	C	B	A	C	A
Approach Vol, veh/h	726		1116			976
Approach Delay, s/veh	20.8		11.1			12.5
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.4	24.1				37.5		16.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	9.0	12.5				7.4		9.8
Green Ext Time (p_c), s	0.1	4.3				13.4		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	14.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	166	15	0	174	0	6
Future Vol, veh/h	166	15	0	174	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	180	16	0	189	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	188
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	854
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	854
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	854	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	9.2	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	172	5	17	168	11	11
Future Vol, veh/h	172	5	17	168	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	187	5	18	183	12	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	192	0	410	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1381	-	598	852
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	817	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1381	-	590	852
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	806	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	734	-	-	1381	-
HCM Lane V/C Ratio	0.033	-	-	0.013	-
HCM Control Delay (s)	10.1	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Cumulative Conditions – Short Term Baseline

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	127	236	142	136	125	228	394	96	40	320	114
Future Volume (veh/h)	177	127	236	142	136	125	228	394	96	40	320	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1727	1727	1827	1843	1900	1827	1863	1863	1900	1819	1900
Adj Flow Rate, veh/h	203	146	271	163	156	144	262	453	110	46	368	131
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	10	10	4	5	5	4	2	2	0	5	5
Cap, veh/h	394	387	321	373	188	174	295	626	523	59	478	167
Arrive On Green	0.22	0.22	0.22	0.21	0.21	0.21	0.17	0.34	0.34	0.03	0.19	0.19
Sat Flow, veh/h	1757	1727	1434	1740	878	811	1740	1863	1557	1810	2476	865
Grp Volume(v), veh/h	203	146	271	163	0	300	262	453	110	46	255	244
Grp Sat Flow(s),veh/h/ln	1757	1727	1434	1740	0	1689	1740	1863	1557	1810	1728	1613
Q Serve(g_s), s	9.2	6.5	16.4	7.4	0.0	15.4	13.3	19.3	4.6	2.3	12.6	13.0
Cycle Q Clear(g_c), s	9.2	6.5	16.4	7.4	0.0	15.4	13.3	19.3	4.6	2.3	12.6	13.0
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	394	387	321	373	0	362	295	626	523	59	334	312
V/C Ratio(X)	0.52	0.38	0.84	0.44	0.00	0.83	0.89	0.72	0.21	0.78	0.76	0.78
Avail Cap(c_a), veh/h	543	534	443	538	0	522	305	689	576	60	383	358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	29.8	33.6	30.8	0.0	34.0	36.8	26.4	21.5	43.5	34.6	34.7
Incr Delay (d2), s/veh	0.4	0.2	7.8	0.3	0.0	4.9	25.1	2.7	0.1	43.8	6.3	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	3.1	7.2	3.6	0.0	7.7	8.5	10.4	2.0	1.9	6.6	6.5
LnGrp Delay(d),s/veh	31.2	30.0	41.4	31.1	0.0	38.9	61.8	29.1	21.6	87.3	40.9	42.8
LnGrp LOS	C	C	D	C		D	E	C	C	F	D	D
Approach Vol, veh/h		620			463			825			545	
Approach Delay, s/veh		35.4			36.2			38.5			45.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	35.9		24.3	19.9	23.0		23.4
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	3.0	33.5		28.0	15.9	20.1		28.0
Max Q Clear Time (g_c+I1), s	4.3	21.3		18.4	15.3	15.0		17.4
Green Ext Time (p_c), s	0.0	3.5		1.1	0.0	2.1		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	38.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	45	11	50	7	490	2	407	55	428	385	1
Future Volume (veh/h)	6	45	11	50	7	490	2	407	55	428	385	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1813	1900	1900	1900	1827	1900	1827	1827	1827	1793	1900
Adj Flow Rate, veh/h	6	48	12	54	8	527	2	438	59	460	414	1
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	4	0	4	4	4	6	6
Cap, veh/h	67	339	78	409	55	844	3	531	445	504	1035	3
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.29	0.29	0.29	0.58	0.58
Sat Flow, veh/h	53	1334	308	1244	215	1547	1810	1827	1532	1740	1787	4
Grp Volume(v), veh/h	66	0	0	62	0	527	2	438	59	460	0	415
Grp Sat Flow(s),veh/h/ln	1696	0	0	1459	0	1547	1810	1827	1532	1740	0	1792
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	17.1	0.1	16.3	2.1	18.6	0.0	9.2
Cycle Q Clear(g_c), s	2.1	0.0	0.0	1.9	0.0	17.1	0.1	16.3	2.1	18.6	0.0	9.2
Prop In Lane	0.09		0.18	0.87		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	485	0	0	464	0	844	3	531	445	504	0	1038
V/C Ratio(X)	0.14	0.00	0.00	0.13	0.00	0.62	0.68	0.82	0.13	0.91	0.00	0.40
Avail Cap(c_a), veh/h	485	0	0	464	0	844	137	615	516	598	0	1084
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	0.0	20.9	0.0	11.5	36.3	24.1	19.0	24.9	0.0	8.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	1.4	69.3	7.9	0.1	16.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	1.0	0.0	7.5	0.1	9.3	0.9	11.1	0.0	4.6
LnGrp Delay(d),s/veh	21.1	0.0	0.0	21.1	0.0	12.9	105.6	32.0	19.2	41.0	0.0	8.6
LnGrp LOS	C			C		B	F	C	B	D		A
Approach Vol, veh/h		66			589			499			875	
Approach Delay, s/veh		21.1			13.8			30.8			25.7	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.1	25.1		22.5	4.1	46.1		22.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	25.0	24.5		18.5	5.5	44.0		18.5
Max Q Clear Time (g_c+I1), s	20.6	18.3		4.1	2.1	11.2		19.1
Green Ext Time (p_c), s	0.5	2.9		2.5	0.0	6.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Future Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1841	1845	1863	1804	1900	1863	1835	1900	1900	1810	1810
Adj Flow Rate, veh/h	64	35	133	55	57	29	182	563	68	20	241	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	3	2	8	8	2	4	4	0	5	5
Cap, veh/h	159	87	217	210	134	68	236	1134	137	45	459	390
Arrive On Green	0.14	0.14	0.14	0.12	0.12	0.12	0.13	0.36	0.36	0.02	0.25	0.00
Sat Flow, veh/h	1153	630	1568	1774	1129	574	1774	3133	377	1810	1810	1538
Grp Volume(v), veh/h	99	0	133	55	0	86	182	313	318	20	241	0
Grp Sat Flow(s),veh/h/ln	1783	0	1568	1774	0	1703	1774	1743	1768	1810	1810	1538
Q Serve(g_s), s	2.0	0.0	3.2	1.1	0.0	1.9	4.0	5.6	5.6	0.4	4.6	0.0
Cycle Q Clear(g_c), s	2.0	0.0	3.2	1.1	0.0	1.9	4.0	5.6	5.6	0.4	4.6	0.0
Prop In Lane	0.65		1.00	1.00		0.34	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	217	210	0	202	236	631	640	45	459	390
V/C Ratio(X)	0.40	0.00	0.61	0.26	0.00	0.43	0.77	0.50	0.50	0.44	0.52	0.00
Avail Cap(c_a), veh/h	1133	0	997	814	0	781	862	1533	1555	293	1006	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.8	0.0	16.3	16.1	0.0	16.4	16.8	10.0	10.0	19.3	12.9	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.0	0.2	0.0	0.5	2.0	0.3	0.3	2.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.5	0.6	0.0	0.9	2.1	2.7	2.8	0.2	2.3	0.0
LnGrp Delay(d),s/veh	16.2	0.0	17.3	16.3	0.0	16.9	18.8	10.3	10.3	21.8	13.4	0.0
LnGrp LOS	B		B	B		B	B	B	B	C	B	
Approach Vol, veh/h		232			141			813			261	
Approach Delay, s/veh		16.8			16.7			12.2			14.0	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.0	18.2		9.0	8.3	13.9		8.9
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	35.3		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	2.4	7.6		5.2	6.0	6.6		3.9
Green Ext Time (p_c), s	0.0	4.1		0.5	0.2	3.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	26.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	393	347	88	80	309
Future Vol, veh/h	92	393	347	88	80	309
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	3	6	10	2
Mvmt Flow	101	432	381	97	88	340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	896	381	0	0	381	0
Stage 1	381	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.29	-
Pot Cap-1 Maneuver	311	662	-	-	1135	-
Stage 1	691	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	281	662	-	-	1135	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.2	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	527	1135	-
HCM Lane V/C Ratio	-	-	1.011	0.077	-
HCM Control Delay (s)	-	-	70.2	8.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	14.5	0.3	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	168	34	68	115	38	72
Future Vol, veh/h	168	34	68	115	38	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	9	7	3	18	6
Mvmt Flow	191	39	77	131	43	82

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	230	0	495	210
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	-	-	4.17	-	6.58	6.26
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.263	-	3.662	3.354
Pot Cap-1 Maneuver	-	-	1309	-	506	820
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1309	-	474	820
Mov Cap-2 Maneuver	-	-	-	-	474	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	655	-	-	1309	-
HCM Lane V/C Ratio	0.191	-	-	0.059	-
HCM Control Delay (s)	11.8	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	201	103	243	187	21	154	435	207	28	947	173
Future Volume (veh/h)	108	201	103	243	187	21	154	435	207	28	947	173
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1743	1863	1743	1810	1727	1792	1810	1827	1863	1881
Adj Flow Rate, veh/h	115	214	110	259	199	22	164	463	220	30	1007	184
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	9	2	9	5	10	6	5	4	2	1
Cap, veh/h	144	341	282	339	356	310	197	1472	816	43	1192	673
Arrive On Green	0.08	0.19	0.19	0.10	0.20	0.20	0.12	0.43	0.43	0.02	0.34	0.34
Sat Flow, veh/h	1707	1792	1482	3442	1743	1518	1645	3406	1538	1740	3539	1599
Grp Volume(v), veh/h	115	214	110	259	199	22	164	463	220	30	1007	184
Grp Sat Flow(s),veh/h/ln	1707	1792	1482	1721	1743	1518	1645	1703	1538	1740	1770	1599
Q Serve(g_s), s	5.2	8.6	5.1	5.8	8.1	0.9	7.7	7.0	6.1	1.3	20.7	5.9
Cycle Q Clear(g_c), s	5.2	8.6	5.1	5.8	8.1	0.9	7.7	7.0	6.1	1.3	20.7	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	341	282	339	356	310	197	1472	816	43	1192	673
V/C Ratio(X)	0.80	0.63	0.39	0.76	0.56	0.07	0.83	0.31	0.27	0.70	0.84	0.27
Avail Cap(c_a), veh/h	163	548	453	342	539	470	220	1472	816	131	1248	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	29.2	27.8	34.5	28.1	25.2	33.8	14.6	10.1	38.0	24.1	14.9
Incr Delay (d2), s/veh	21.7	4.0	1.9	9.7	2.9	0.2	21.1	0.3	0.4	19.1	6.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	4.7	2.2	3.2	4.2	0.4	4.6	3.3	2.6	0.9	11.1	2.7
LnGrp Delay(d),s/veh	57.0	33.3	29.7	44.3	31.0	25.4	54.9	14.9	10.5	57.1	30.1	15.3
LnGrp LOS	E	C	C	D	C	C	D	B	B	E	C	B
Approach Vol, veh/h		439			480			847			1221	
Approach Delay, s/veh		38.6			37.9			21.5			28.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	39.4	12.2	20.4	13.9	31.9	11.1	21.5
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.9	32.3	7.8	24.0	10.5	27.7	7.5	24.3
Max Q Clear Time (g_c+I1), s	3.3	9.0	7.8	10.6	9.7	22.7	7.2	10.1
Green Ext Time (p_c), s	0.0	19.3	0.0	4.3	0.0	3.7	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	126	0	95	0	716	98	141	1152	1
Future Volume (vph)	0	0	104	126	0	95	0	716	98	141	1152	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	5.5
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.95	1.00
Frpb, ped/bikes			0.98	1.00		1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	1.00
Frt			0.86	1.00		0.85		0.98		1.00	1.00	0.85
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)			1457	1766		1495		3360		1736	3539	1615
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)			1457	1766		1495		3360		1736	3539	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	134	0	101	0	762	104	150	1226	1
RTOR Reduction (vph)	0	0	93	0	0	85	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	18	134	0	16	0	851	0	150	1226	1
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	Perm
Protected Phases								6		5	2	
Permitted Phases			4	8		8						2
Actuated Green, G (s)			8.3	8.3		8.3		24.6		5.8	34.4	34.4
Effective Green, g (s)			8.3	8.3		8.3		24.6		5.8	34.4	34.4
Actuated g/C Ratio			0.16	0.16		0.16		0.47		0.11	0.66	0.66
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	5.5
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	4.0
Lane Grp Cap (vph)			231	280		237		1583		192	2332	1064
v/s Ratio Prot								0.25		c0.09	c0.35	
v/s Ratio Perm			0.01	c0.08		0.01						0.00
v/c Ratio			0.08	0.48		0.07		0.54		0.78	0.53	0.00
Uniform Delay, d1			18.7	20.0		18.7		9.8		22.6	4.6	3.0
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2			0.1	1.8		0.2		0.5		17.1	0.3	0.0
Delay (s)			18.8	21.7		18.8		10.2		39.7	4.9	3.0
Level of Service			B	C		B		B		D	A	A
Approach Delay (s)		18.8			20.5			10.2			8.7	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	52.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	23	241	149	41	28	265	697	113	89	1195	93
Future Volume (veh/h)	106	23	241	149	41	28	265	697	113	89	1195	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1776	1881	1743	1845	1863
Adj Flow Rate, veh/h	110	24	251	155	43	29	276	726	118	93	1245	97
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	1	9	3	2
Cap, veh/h	135	229	322	182	276	241	305	1771	839	116	1459	650
Arrive On Green	0.08	0.13	0.13	0.11	0.16	0.16	0.18	0.52	0.52	0.07	0.42	0.42
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	3374	1597	1660	3505	1562
Grp Volume(v), veh/h	110	24	251	155	43	29	276	726	118	93	1245	97
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1687	1597	1660	1752	1562
Q Serve(g_s), s	6.9	1.3	10.3	9.6	2.2	1.7	16.5	13.6	4.0	5.8	33.5	4.0
Cycle Q Clear(g_c), s	6.9	1.3	10.3	9.6	2.2	1.7	16.5	13.6	4.0	5.8	33.5	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	229	322	182	276	241	305	1771	839	116	1459	650
V/C Ratio(X)	0.81	0.10	0.78	0.85	0.16	0.12	0.90	0.41	0.14	0.80	0.85	0.15
Avail Cap(c_a), veh/h	189	501	705	192	500	437	331	1771	839	221	1533	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	39.9	43.8	45.5	37.7	37.5	41.9	15.0	12.7	47.8	27.6	19.0
Incr Delay (d2), s/veh	16.8	0.2	4.1	27.8	0.3	0.2	25.7	0.3	0.2	11.7	5.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.6	3.7	5.8	1.1	0.7	10.0	6.3	1.8	3.0	17.2	1.8
LnGrp Delay(d),s/veh	63.9	40.1	48.0	73.4	38.0	37.7	67.6	15.3	12.9	59.5	32.9	19.2
LnGrp LOS	E	D	D	E	D	D	E	B	B	E	C	B
Approach Vol, veh/h		385			227			1120			1435	
Approach Delay, s/veh		52.0			62.1			28.0			33.7	
Approach LOS		D			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	59.7	15.5	17.7	22.7	48.4	12.6	20.7
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	13.9	51.9	12.2	30.0	20.2	45.6	12.0	30.2
Max Q Clear Time (g_c+I1), s	7.8	15.6	11.6	12.3	18.5	35.5	8.9	4.2
Green Ext Time (p_c), s	0.1	31.6	0.0	1.4	0.2	7.9	0.1	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
9: Sierra College Blvd & I-80 WB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	89	632	71	268	108	829	197	0	1534	63
Future Volume (veh/h)	20	0	89	632	71	268	108	829	197	0	1534	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1759	1845	1810	1776	1827	1792	1681	0	1696	1900
Adj Flow Rate, veh/h	22	0	98	695	241	186	119	911	216	0	1686	69
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	8	3	2	7	4	6	13	0	12	0
Cap, veh/h	39	0	0	755	274	229	464	3389	990	0	1733	604
Arrive On Green	0.02	0.00	0.00	0.21	0.15	0.15	0.53	1.00	1.00	0.00	0.37	0.37
Sat Flow, veh/h	1810	22		3514	1810	1509	1740	4893	1429	0	4784	1615
Grp Volume(v), veh/h	22	62.7		695	241	186	119	911	216	0	1686	69
Grp Sat Flow(s),veh/h/ln	1810	E		1757	1810	1509	1740	1631	1429	0	1544	1615
Q Serve(g_s), s	1.4			23.2	15.6	14.3	4.4	0.0	0.0	0.0	43.0	3.4
Cycle Q Clear(g_c), s	1.4			23.2	15.6	14.3	4.4	0.0	0.0	0.0	43.0	3.4
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	39			755	274	229	464	3389	990	0	1733	604
V/C Ratio(X)	0.56			0.92	0.88	0.81	0.26	0.27	0.22	0.00	0.97	0.11
Avail Cap(c_a), veh/h	92			1467	588	491	464	3389	990	0	1733	604
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.54	0.54
Uniform Delay (d), s/veh	58.1			46.1	49.8	49.3	21.6	0.0	0.0	0.0	37.0	24.5
Incr Delay (d2), s/veh	4.6			2.1	3.6	2.6	0.1	0.2	0.5	0.0	10.7	0.2
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8			11.5	8.1	6.2	2.1	0.1	0.1	0.0	20.0	1.5
LnGrp Delay(d),s/veh	62.7			48.2	53.4	51.9	21.7	0.2	0.5	0.0	47.6	24.8
LnGrp LOS	E			D	D	D	C	A	A		D	C
Approach Vol, veh/h					1122			1246			1755	
Approach Delay, s/veh					49.9			2.3			46.7	
Approach LOS					D			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		89.3	30.7		38.2	51.1	7.2	23.5
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		58.8	50.1		9.2	* 45	6.1	39.0
Max Q Clear Time (g_c+I1), s		2.0	25.2		6.4	45.0	3.4	17.6
Green Ext Time (p_c), s		2.8	0.5		1.1	0.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	374	104	203	46	0	111	0	1016	33	195	1246	296
Future Volume (veh/h)	374	104	203	46	0	111	0	1016	33	195	1246	296
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1845	1776	1845	0	1863	0	1667	1792	1863	1863	1743
Adj Flow Rate, veh/h	430	120	233	53	0	128	0	1168	38	224	1432	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	7	3	7	3	0	2	0	14	6	2	2	9
Cap, veh/h	846	600	258	85	0	0	0	1317	350	1276	2308	966
Arrive On Green	0.26	0.17	0.17	0.05	0.00	0.00	0.00	0.46	0.46	0.74	1.00	0.00
Sat Flow, veh/h	3281	3505	1509	1757	53		0	5967	1524	3442	3539	1482
Grp Volume(v), veh/h	430	120	233	53	58.8		0	1168	38	224	1432	0
Grp Sat Flow(s),veh/h/ln	1640	1752	1509	1757	E		0	1433	1524	1721	1770	1482
Q Serve(g_s), s	13.4	3.5	18.2	3.6			0.0	22.3	1.4	2.3	0.0	0.0
Cycle Q Clear(g_c), s	13.4	3.5	18.2	3.6			0.0	22.3	1.4	2.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	846	600	258	85			0	1317	350	1276	2308	966
V/C Ratio(X)	0.51	0.20	0.90	0.62			0.00	0.89	0.11	0.18	0.62	0.00
Avail Cap(c_a), veh/h	846	1227	528	108			0	1787	475	1276	2308	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.0	42.7	48.7	56.0			0.0	31.0	17.1	10.1	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.1	4.6	2.8			0.0	8.8	0.6	0.0	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	1.7	7.9	1.8			0.0	9.6	0.6	1.1	0.4	0.0
LnGrp Delay(d),s/veh	38.4	42.7	53.4	58.8			0.0	39.8	17.7	10.1	1.3	0.0
LnGrp LOS	D	D	D	E				D	B	B	A	
Approach Vol, veh/h		783						1206			1656	
Approach Delay, s/veh		43.5						39.1			2.5	
Approach LOS		D						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	50.7	33.8	10.4	25.1		84.5	35.5	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	13.2	* 37	7.4	42.0		55.2	23.3	
Max Q Clear Time (g_c+I1), s	4.3	24.3	5.6	20.2		2.0	15.4	
Green Ext Time (p_c), s	3.5	3.3	0.0	0.4		5.2	0.8	

Intersection Summary	
HCM 2010 Ctrl Delay	23.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	5	120	0	176	7	866	60	0	1450	13
Future Volume (veh/h)	7	0	5	120	0	176	7	866	60	0	1450	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1900	1532	1863	1778	1900	0	1810	1863
Adj Flow Rate, veh/h	8	0	5	148	0	217	8	1069	74	0	1790	14
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.81	0.92	0.81	0.92	0.81	0.81	0.81	0.81	0.92
Percent Heavy Veh, %	2	2	2	2	2	24	2	7	7	0	5	2
Cap, veh/h	26	0	23	271	0	195	17	4256	293	0	2323	1070
Arrive On Green	0.01	0.00	0.01	0.15	0.00	0.15	0.01	0.72	0.72	0.00	1.00	1.00
Sat Flow, veh/h	1774	0	1583	1810	0	1302	1774	5887	405	0	3529	1583
Grp Volume(v), veh/h	8	0	5	148	0	217	8	832	311	0	1790	14
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1810	0	1302	1774	1529	1706	0	1719	1583
Q Serve(g_s), s	0.5	0.0	0.4	9.1	0.0	18.0	0.5	7.4	7.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	9.1	0.0	18.0	0.5	7.4	7.4	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	0.00		1.00
Lane Grp Cap(c), veh/h	26	0	23	271	0	195	17	3316	1233	0	2323	1070
V/C Ratio(X)	0.31	0.00	0.22	0.55	0.00	1.11	0.46	0.25	0.25	0.00	0.77	0.01
Avail Cap(c_a), veh/h	266	0	237	271	0	195	74	3316	1233	0	2323	1070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.96	0.96	0.96	0.00	0.77	0.77
Uniform Delay (d), s/veh	58.5	0.0	58.4	47.2	0.0	51.0	59.1	5.6	5.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.5	0.0	4.5	2.3	0.0	97.2	17.2	0.2	0.5	0.0	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.2	4.7	0.0	11.7	0.3	3.1	3.6	0.0	0.6	0.0
LnGrp Delay(d),s/veh	65.0	0.0	63.0	49.5	0.0	148.2	76.3	5.8	6.1	0.0	2.0	0.0
LnGrp LOS	E		E	D		F	E	A	A		A	A
Approach Vol, veh/h		13			365			1151			1804	
Approach Delay, s/veh		64.2			108.2			6.4			1.9	
Approach LOS		E			F			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		91.2		6.3	5.7	85.6		22.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		70.5		18.0	5.0	61.0		18.0
Max Q Clear Time (g_c+I1), s		9.4		2.5	2.5	2.0		20.0
Green Ext Time (p_c), s		46.9		0.0	0.0	45.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	1	38	1	8	0	923	25	40	1532	3
Future Volume (veh/h)	2	0	1	38	1	8	0	923	25	40	1532	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1267	1900	1900	1597	1900	1520	1900	1792	1743	1387	1827	1429
Adj Flow Rate, veh/h	2	0	1	48	1	10	0	1154	31	50	1915	4
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	50	0	0	19	0	25	0	6	9	37	4	33
Cap, veh/h	3	0	2	115	72	49	2	3399	1029	57	2736	956
Arrive On Green	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.69	0.69	0.04	0.79	0.79
Sat Flow, veh/h	1206	0	1615	2950	1900	1292	1810	4893	1481	1321	3471	1214
Grp Volume(v), veh/h	2	0	1	48	1	10	0	1154	31	50	1915	4
Grp Sat Flow(s),veh/h/ln	1206	0	1615	1475	1900	1292	1810	1631	1481	1321	1736	1214
Q Serve(g_s), s	0.1	0.0	0.1	1.4	0.0	0.7	0.0	8.4	0.6	3.4	23.3	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	1.4	0.0	0.7	0.0	8.4	0.6	3.4	23.3	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	0	2	115	72	49	2	3399	1029	57	2736	956
V/C Ratio(X)	0.61	0.00	0.45	0.42	0.01	0.21	0.00	0.34	0.03	0.88	0.70	0.00
Avail Cap(c_a), veh/h	68	0	616	198	745	507	101	3714	1124	185	2926	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	0.0	44.5	41.9	41.3	41.6	0.0	5.4	4.2	42.5	4.5	2.0
Incr Delay (d2), s/veh	113.6	0.0	118.0	2.4	0.1	2.5	0.0	0.1	0.0	31.7	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	0.6	0.0	0.3	0.0	3.8	0.2	1.7	11.2	0.0
LnGrp Delay(d),s/veh	158.0	0.0	162.5	44.3	41.4	44.1	0.0	5.5	4.3	74.2	5.2	2.0
LnGrp LOS	F		F	D	D	D		A	A	E	A	A
Approach Vol, veh/h		3			59			1185			1969	
Approach Delay, s/veh		159.5			44.2			5.5			7.0	
Approach LOS		F			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	67.8	8.0	5.1	0.0	76.1	4.7	8.4
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	12.5	67.7	6.0	34.0	5.0	75.2	5.0	35.0
Max Q Clear Time (g_c+I1), s	5.4	10.4	3.4	2.1	0.0	25.3	2.1	2.7
Green Ext Time (p_c), s	0.0	51.0	0.0	0.0	0.0	45.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	8	73	896	1391	304
Future Volume (veh/h)	22	8	73	896	1391	304
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1900	1900	1810	1825	1900
Adj Flow Rate, veh/h	29	11	96	1179	1830	400
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	5	0	0	5	5	5
Cap, veh/h	135	65	124	2719	2662	571
Arrive On Green	0.04	0.04	0.07	0.79	0.65	0.65
Sat Flow, veh/h	3343	1615	1810	3529	4274	881
Grp Volume(v), veh/h	29	11	96	1179	1472	758
Grp Sat Flow(s),veh/h/ln	1672	1615	1810	1719	1661	1669
Q Serve(g_s), s	0.5	0.4	3.2	6.6	16.9	17.7
Cycle Q Clear(g_c), s	0.5	0.4	3.2	6.6	16.9	17.7
Prop In Lane	1.00	1.00	1.00			0.53
Lane Grp Cap(c), veh/h	135	65	124	2719	2152	1081
V/C Ratio(X)	0.21	0.17	0.77	0.43	0.68	0.70
Avail Cap(c_a), veh/h	1079	521	195	2861	2160	1085
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	28.0	27.7	2.0	6.7	6.9
Incr Delay (d2), s/veh	0.8	1.2	9.8	0.1	1.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	1.9	3.0	7.9	8.6
LnGrp Delay(d),s/veh	28.9	29.2	37.5	2.1	7.7	9.0
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	40			1275	2230	
Approach Delay, s/veh	29.0			4.8	8.1	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		6.9	8.6	44.9				53.5
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		19.5	6.5	39.3				50.3
Max Q Clear Time (g_c+I1), s		2.5	5.2	19.7				8.6
Green Ext Time (p_c), s		0.1	0.0	19.0				39.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	306	296	125	345	164	430	690	90	147	828	244
Future Volume (veh/h)	128	306	296	125	345	164	430	690	90	147	828	244
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1863	1845	1900	1863	1900	1881	1780	1900	1696	1827	1827
Adj Flow Rate, veh/h	154	369	357	151	416	198	518	831	108	177	998	294
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	6	2	3	0	2	2	1	7	7	12	4	4
Cap, veh/h	185	1104	484	97	596	280	262	936	122	191	1768	539
Arrive On Green	0.11	0.31	0.31	0.05	0.26	0.26	0.08	0.31	0.31	0.12	0.35	0.35
Sat Flow, veh/h	1707	3539	1553	1810	2318	1090	3476	3006	391	1616	4988	1522
Grp Volume(v), veh/h	154	369	357	151	316	298	518	467	472	177	998	294
Grp Sat Flow(s),veh/h/ln	1707	1770	1553	1810	1770	1639	1738	1691	1707	1616	1663	1522
Q Serve(g_s), s	8.2	7.4	19.1	5.0	15.0	15.3	7.0	24.4	24.4	10.1	15.0	14.4
Cycle Q Clear(g_c), s	8.2	7.4	19.1	5.0	15.0	15.3	7.0	24.4	24.4	10.1	15.0	14.4
Prop In Lane	1.00		1.00	1.00		0.67	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	185	1104	484	97	455	421	262	526	531	191	1768	539
V/C Ratio(X)	0.83	0.33	0.74	1.55	0.70	0.71	1.98	0.89	0.89	0.93	0.56	0.55
Avail Cap(c_a), veh/h	221	1181	518	97	457	423	262	528	533	191	1772	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	24.6	28.6	43.9	31.2	31.3	42.9	30.4	30.4	40.5	24.2	24.0
Incr Delay (d2), s/veh	19.9	0.6	8.4	291.8	5.0	5.8	453.5	18.7	18.6	44.3	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	3.7	9.3	10.4	7.9	7.6	19.8	14.2	14.3	6.8	6.9	6.3
LnGrp Delay(d),s/veh	60.5	25.2	37.0	335.8	36.2	37.1	496.4	49.2	49.1	84.9	24.7	25.5
LnGrp LOS	E	C	D	F	D	D	F	D	D	F	C	C
Approach Vol, veh/h		880			765			1457			1469	
Approach Delay, s/veh		36.2			95.7			208.1			32.1	
Approach LOS		D			F			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	33.9	9.0	35.0	11.0	37.9	14.1	29.9
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	29.0	5.0	31.0	7.0	33.0	12.0	24.0
Max Q Clear Time (g_c+I1), s	12.1	26.4	7.0	21.1	9.0	17.0	10.2	17.3
Green Ext Time (p_c), s	0.0	2.5	0.0	7.6	0.0	14.7	0.1	5.4

Intersection Summary	
HCM 2010 Ctrl Delay	99.6
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	21	170	71	67	51	125	398	79	36	394	47
Future Volume (veh/h)	51	21	170	71	67	51	125	398	79	36	394	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1535	1484	1900	1695	1792	1712	1738	1900	1387	1776	1727
Adj Flow Rate, veh/h	56	23	187	78	74	56	137	437	87	40	433	52
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	33	33	28	9	9	6	11	7	7	37	7	10
Cap, veh/h	91	19	481	80	47	581	166	525	105	52	551	445
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.10	0.37	0.37	0.04	0.31	0.31
Sat Flow, veh/h	0	49	1260	0	124	1522	1630	1408	280	1321	1776	1435
Grp Volume(v), veh/h	79	0	187	152	0	56	137	0	524	40	433	52
Grp Sat Flow(s),veh/h/ln	49	0	1260	124	0	1522	1630	0	1688	1321	1776	1435
Q Serve(g_s), s	0.0	0.0	7.3	0.0	0.0	1.6	5.6	0.0	19.2	2.0	15.1	1.8
Cycle Q Clear(g_c), s	25.9	0.0	7.3	25.9	0.0	1.6	5.6	0.0	19.2	2.0	15.1	1.8
Prop In Lane	0.71		1.00	0.51		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	109	0	481	128	0	581	166	0	629	52	551	445
V/C Ratio(X)	0.72	0.00	0.39	1.19	0.00	0.10	0.83	0.00	0.83	0.78	0.79	0.12
Avail Cap(c_a), veh/h	109	0	481	128	0	581	166	0	629	105	607	491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	15.2	24.7	0.0	13.5	29.9	0.0	19.3	32.3	21.3	16.7
Incr Delay (d2), s/veh	21.5	0.0	0.6	139.7	0.0	0.1	28.1	0.0	10.8	24.5	8.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	2.6	7.3	0.0	0.7	3.8	0.0	10.8	1.1	8.6	0.7
LnGrp Delay(d),s/veh	49.4	0.0	15.8	164.3	0.0	13.5	58.0	0.0	30.1	56.9	29.8	17.1
LnGrp LOS	D		B	F		B	E		C	E	C	B
Approach Vol, veh/h		266			208			661			525	
Approach Delay, s/veh		25.8			123.7			35.9			30.6	
Approach LOS		C			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	30.7		30.4	11.0	26.4		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.4	24.7		25.9	6.9	23.2		25.9
Max Q Clear Time (g_c+I1), s	4.0	21.2		27.9	7.6	17.1		27.9
Green Ext Time (p_c), s	0.0	2.8		0.0	0.0	3.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	117	75	540	164	140	45	496	584	294	611	19
Future Volume (veh/h)	25	117	75	540	164	140	45	496	584	294	611	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1881	1900	1845	1837	1863	1863	1792	1863	1827	1779	1900
Adj Flow Rate, veh/h	28	130	83	391	475	156	50	551	649	327	679	21
Adj No. of Lanes	1	2	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	1	3	4	2	2	6	2	4	7	7
Cap, veh/h	155	214	128	463	484	415	64	967	449	352	1505	47
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.04	0.28	0.28	0.20	0.45	0.45
Sat Flow, veh/h	1547	2143	1277	1757	1837	1574	1774	3406	1580	1740	3345	103
Grp Volume(v), veh/h	28	107	106	391	475	156	50	551	649	327	343	357
Grp Sat Flow(s),veh/h/ln	1547	1787	1633	1757	1837	1574	1774	1703	1580	1740	1690	1758
Q Serve(g_s), s	2.0	7.1	7.7	26.0	31.6	10.0	3.4	17.0	35.0	22.8	17.3	17.3
Cycle Q Clear(g_c), s	2.0	7.1	7.7	26.0	31.6	10.0	3.4	17.0	35.0	22.8	17.3	17.3
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	155	179	163	463	484	415	64	967	449	352	760	791
V/C Ratio(X)	0.18	0.60	0.65	0.84	0.98	0.38	0.78	0.57	1.45	0.93	0.45	0.45
Avail Cap(c_a), veh/h	351	406	371	463	484	415	130	967	449	367	760	791
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	53.1	53.4	43.0	45.0	37.1	58.9	37.7	44.1	48.3	23.4	23.4
Incr Delay (d2), s/veh	0.6	3.2	4.3	13.3	35.7	0.6	17.7	1.0	213.0	29.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.6	3.7	14.3	20.9	4.4	2.0	8.2	41.8	13.8	8.1	8.5
LnGrp Delay(d),s/veh	51.4	56.3	57.7	56.3	80.8	37.6	76.6	38.7	257.1	77.5	24.0	24.0
LnGrp LOS	D	E	E	E	F	D	E	D	F	E	C	C
Approach Vol, veh/h		241			1022			1250			1027	
Approach Delay, s/veh		56.3			64.8			153.6			41.0	
Approach LOS		E			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.9	40.0		17.3	8.5	60.4		37.0
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	26.0	35.0		28.0	9.0	52.0		32.5
Max Q Clear Time (g_c+I1), s	24.8	37.0		9.7	5.4	19.3		33.6
Green Ext Time (p_c), s	0.1	0.0		1.2	0.0	20.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	88.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	976	13	17	794	558	12	16	6	356	11	143
Future Volume (veh/h)	154	976	13	17	794	558	12	16	6	356	11	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1792	1863	1827	1900	1675	1900	1759	1767	1776
Adj Flow Rate, veh/h	177	1122	15	20	913	0	14	18	7	418	0	164
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	1	1	6	2	4	0	12	12	8	0	7
Cap, veh/h	218	1614	22	31	1211	532	181	115	45	640	0	286
Arrive On Green	0.12	0.45	0.45	0.02	0.34	0.00	0.10	0.10	0.10	0.19	0.00	0.19
Sat Flow, veh/h	1774	3612	48	1707	3539	1553	1810	1145	445	3351	0	1500
Grp Volume(v), veh/h	177	555	582	20	913	0	14	0	25	418	0	164
Grp Sat Flow(s),veh/h/ln	1774	1787	1873	1707	1770	1553	1810	0	1591	1675	0	1500
Q Serve(g_s), s	7.8	19.9	19.9	0.9	18.3	0.0	0.6	0.0	1.1	9.2	0.0	7.9
Cycle Q Clear(g_c), s	7.8	19.9	19.9	0.9	18.3	0.0	0.6	0.0	1.1	9.2	0.0	7.9
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	218	799	837	31	1211	532	181	0	159	640	0	286
V/C Ratio(X)	0.81	0.69	0.70	0.65	0.75	0.00	0.08	0.00	0.16	0.65	0.00	0.57
Avail Cap(c_a), veh/h	277	799	837	109	1240	544	181	0	159	1342	0	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.2	17.7	17.7	39.0	23.3	0.0	32.6	0.0	32.9	29.9	0.0	29.4
Incr Delay (d2), s/veh	13.4	4.3	4.1	21.0	3.9	0.0	0.8	0.0	2.1	1.6	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	10.7	11.1	0.6	9.5	0.0	0.3	0.0	0.6	4.4	0.0	3.5
LnGrp Delay(d),s/veh	47.6	22.1	21.9	60.0	27.2	0.0	33.4	0.0	35.0	31.5	0.0	31.9
LnGrp LOS	D	C	C	E	C		C		C	C		C
Approach Vol, veh/h		1314			933			39			582	
Approach Delay, s/veh		25.4			27.9			34.4			31.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		13.0	5.9	40.7		20.3	14.3	32.4
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		8.0	5.1	35.4		32.0	12.5	28.0
Max Q Clear Time (g_c+I1), s		3.1	2.9	21.9		11.2	9.8	20.3
Green Ext Time (p_c), s		0.0	0.0	12.9		3.3	0.1	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	27.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	890	518	411	1218	0	0	0	0	46	0	220
Future Volume (veh/h)	0	890	518	411	1218	0	0	0	0	46	0	220
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1810	1881	1845	0				1827	1827	1900
Adj Flow Rate, veh/h	0	1000	582	462	1369	0				52	0	247
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	5	1	3	0				4	0	4
Cap, veh/h	0	1356	588	482	2503	0				320	0	285
Arrive On Green	0.00	0.38	0.38	0.54	1.00	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3632	1534	1792	3597	0				1740	0	1553
Grp Volume(v), veh/h	0	1000	582	462	1369	0				52	0	247
Grp Sat Flow(s),veh/h/ln	0	1770	1534	1792	1752	0				1740	0	1553
Q Serve(g_s), s	0.0	21.9	33.9	22.2	0.0	0.0				2.3	0.0	13.9
Cycle Q Clear(g_c), s	0.0	21.9	33.9	22.2	0.0	0.0				2.3	0.0	13.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1356	588	482	2503	0				320	0	285
V/C Ratio(X)	0.00	0.74	0.99	0.96	0.55	0.00				0.16	0.00	0.87
Avail Cap(c_a), veh/h	0	1356	588	486	2503	0				445	0	397
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.70	0.70	0.25	0.25	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.9	27.6	20.3	0.0	0.0				30.9	0.0	35.7
Incr Delay (d2), s/veh	0.0	2.5	28.7	12.2	0.2	0.0				0.1	0.0	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.2	18.9	12.4	0.1	0.0				1.1	0.0	6.8
LnGrp Delay(d),s/veh	0.0	26.4	56.3	32.6	0.2	0.0				31.0	0.0	46.2
LnGrp LOS		C	E	C	A					C		D
Approach Vol, veh/h		1582			1831						299	
Approach Delay, s/veh		37.4			8.4						43.6	
Approach LOS		D			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.8	39.6		20.6		69.4		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	24.4	27.8		23.0		57.8		
Max Q Clear Time (g_c+I1), s	24.2	35.9		15.9		2.0		
Green Ext Time (p_c), s	0.0	0.0		0.6		25.6		

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	733	0	0	977	57	652	2	853	0	0	0
Future Volume (veh/h)	203	733	0	0	977	57	652	2	853	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1863	0	0	1863	1900	1845	1872	1881			
Adj Flow Rate, veh/h	226	814	0	0	1086	63	1055	0	595			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	2	0	0	2	2	3	0	1			
Cap, veh/h	254	1903	0	0	1204	70	1284	0	585			
Arrive On Green	0.29	1.00	0.00	0.00	0.35	0.35	0.37	0.00	0.37			
Sat Flow, veh/h	1757	3632	0	0	3493	197	3514	0	1599			
Grp Volume(v), veh/h	226	814	0	0	565	584	1055	0	595			
Grp Sat Flow(s),veh/h/ln	1757	1770	0	0	1770	1828	1757	0	1599			
Q Serve(g_s), s	11.1	0.0	0.0	0.0	27.3	27.3	24.5	0.0	32.9			
Cycle Q Clear(g_c), s	11.1	0.0	0.0	0.0	27.3	27.3	24.5	0.0	32.9			
Prop In Lane	1.00		0.00	0.00		0.11	1.00		1.00			
Lane Grp Cap(c), veh/h	254	1903	0	0	627	647	1284	0	585			
V/C Ratio(X)	0.89	0.43	0.00	0.00	0.90	0.90	0.82	0.00	1.02			
Avail Cap(c_a), veh/h	256	1903	0	0	627	647	1284	0	585			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.62	0.62	0.00	0.00	0.86	0.86	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.3	0.0	0.0	0.0	27.6	27.6	25.9	0.0	28.6			
Incr Delay (d2), s/veh	19.7	0.4	0.0	0.0	16.5	16.2	4.6	0.0	41.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.7	0.1	0.0	0.0	16.2	16.7	12.7	0.0	21.2			
LnGrp Delay(d),s/veh	51.0	0.4	0.0	0.0	44.1	43.8	30.5	0.0	70.4			
LnGrp LOS	D	A			D	D	C		F			
Approach Vol, veh/h		1040			1149			1650				
Approach Delay, s/veh		11.4			43.9			44.9				
Approach LOS		B			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		53.0			16.5	36.5		37.0
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		48.4			13.1	31.8		32.9
Max Q Clear Time (g_c+I1), s		2.0			13.1	29.3		34.9
Green Ext Time (p_c), s		13.1			0.0	2.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1491	61	10	893	0	140	0	25	0	0	0
Future Volume (veh/h)	49	1491	61	10	893	0	140	0	25	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1875	1900	1583	1863	0	1845	0	1638			
Adj Flow Rate, veh/h	56	1714	70	11	1026	0	161	0	29			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Percent Heavy Veh, %	0	1	1	20	2	0	3	0	16			
Cap, veh/h	101	2387	97	17	2265	0	210	0	166			
Arrive On Green	0.06	0.68	0.68	0.01	0.64	0.00	0.12	0.00	0.12			
Sat Flow, veh/h	1810	3485	142	1508	3632	0	1757	0	1392			
Grp Volume(v), veh/h	56	871	913	11	1026	0	161	0	29			
Grp Sat Flow(s),veh/h/ln	1810	1781	1846	1508	1770	0	1757	0	1392			
Q Serve(g_s), s	2.2	22.0	22.5	0.5	10.7	0.0	6.5	0.0	1.4			
Cycle Q Clear(g_c), s	2.2	22.0	22.5	0.5	10.7	0.0	6.5	0.0	1.4			
Prop In Lane	1.00		0.08	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	101	1220	1264	17	2265	0	210	0	166			
V/C Ratio(X)	0.55	0.71	0.72	0.67	0.45	0.00	0.77	0.00	0.17			
Avail Cap(c_a), veh/h	173	1220	1264	116	2337	0	513	0	406			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.6	7.1	7.2	36.0	6.7	0.0	31.2	0.0	28.9			
Incr Delay (d2), s/veh	4.7	2.8	2.8	37.5	0.4	0.0	5.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	11.6	12.1	0.4	5.3	0.0	3.5	0.0	0.5			
LnGrp Delay(d),s/veh	38.3	9.9	10.0	73.5	7.1	0.0	37.0	0.0	29.4			
LnGrp LOS	D	A	A	E	A		D		C			
Approach Vol, veh/h		1840			1037			190				
Approach Delay, s/veh		10.8			7.8			35.8				
Approach LOS		B			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.8	55.0			8.1	51.7		13.2
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	49.6			7.0	48.2		21.3
Max Q Clear Time (g_c+I1), s	2.5	24.5			4.2	12.7		8.5
Green Ext Time (p_c), s	0.0	24.7			0.0	34.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	814	1377	4
Future Vol, veh/h	0	0	16	814	1377	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	857	1449	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	727	1454	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	371	471	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	371	471	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	471	-	-	-	-
HCM Lane V/C Ratio	0.036	-	-	-	-
HCM Control Delay (s)	12.9	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	99	126	92	168	275	96
Future Vol, veh/h	99	126	92	168	275	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	137	100	183	299	104

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	642	202	403	0	-	0
Stage 1	351	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	407	805	1152	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	372	805	1152	-	-	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1152	-	372	805	-	-
HCM Lane V/C Ratio	0.087	-	0.289	0.17	-	-
HCM Control Delay (s)	8.4	-	18.6	10.4	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.2	0.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	524	922	41	12	635	135	161	13	20	12	4	63
Future Volume (veh/h)	524	922	41	12	635	135	161	13	20	12	4	63
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	570	1002	45	13	690	147	175	14	22	13	42	42
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	613	1631	73	264	834	177	221	82	128	22	72	81
Arrive On Green	0.35	0.47	0.47	0.15	0.29	0.29	0.12	0.12	0.12	0.05	0.05	0.05
Sat Flow, veh/h	1774	3450	155	1774	2905	618	1774	654	1028	435	1406	1583
Grp Volume(v), veh/h	570	514	533	13	420	417	175	0	36	55	0	42
Grp Sat Flow(s),veh/h/ln	1774	1770	1835	1774	1770	1754	1774	0	1681	1841	0	1583
Q Serve(g_s), s	27.5	19.2	19.2	0.6	19.7	19.7	8.5	0.0	1.7	2.6	0.0	2.3
Cycle Q Clear(g_c), s	27.5	19.2	19.2	0.6	19.7	19.7	8.5	0.0	1.7	2.6	0.0	2.3
Prop In Lane	1.00		0.08	1.00		0.35	1.00		0.61	0.24		1.00
Lane Grp Cap(c), veh/h	613	837	868	264	508	503	221	0	210	94	0	81
V/C Ratio(X)	0.93	0.61	0.61	0.05	0.83	0.83	0.79	0.00	0.17	0.58	0.00	0.52
Avail Cap(c_a), veh/h	719	1156	1199	264	538	533	599	0	568	104	0	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	17.4	17.4	32.4	29.6	29.6	37.7	0.0	34.7	41.2	0.0	41.1
Incr Delay (d2), s/veh	17.0	2.7	2.6	0.1	13.2	13.3	6.2	0.0	0.4	6.8	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.4	9.9	10.2	0.3	11.4	11.4	4.6	0.0	0.8	1.5	0.0	1.1
LnGrp Delay(d),s/veh	45.0	20.0	20.0	32.5	42.7	42.9	44.0	0.0	35.1	48.0	0.0	46.1
LnGrp LOS	D	C	B	C	D	D	D		D	D		D
Approach Vol, veh/h		1617			850			211			97	
Approach Delay, s/veh		28.8			42.7			42.4			47.2	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.2	47.0		15.1	34.7	30.5		8.5
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 58		30.0	36.0	27.0		5.0
Max Q Clear Time (g_c+I1), s	2.6	21.2		10.5	29.5	21.7		4.6
Green Ext Time (p_c), s	1.9	20.8		0.6	1.2	3.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	41.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	250	529	158	228	0	302	0	78	1	0	1
Future Vol, veh/h	0	250	529	158	228	0	302	0	78	1	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	13	5	7	13	0	9	0	4	0	0	0
Mvmt Flow	0	278	588	176	253	0	336	0	87	1	0	1
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	59.3	18.1	30.1	12.1
HCM LOS	F	C	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	50%
Vol Thru, %	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	100%	0%	100%	0%	0%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	302	78	250	529	158	228	2
LT Vol	302	0	0	0	158	0	1
Through Vol	0	0	250	0	0	228	0
RT Vol	0	78	0	529	0	0	1
Lane Flow Rate	336	87	278	588	176	253	2
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.777	0.167	0.565	1.055	0.395	0.541	0.005
Departure Headway (Hd)	8.463	7.076	7.319	6.462	8.252	7.842	9.101
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	430	510	497	564	439	464	396
Service Time	6.163	4.776	5.019	4.162	5.952	5.542	7.101
HCM Lane V/C Ratio	0.781	0.171	0.559	1.043	0.401	0.545	0.005
HCM Control Delay	35	11.2	19.1	78.3	16.2	19.4	12.1
HCM Lane LOS	D	B	C	F	C	C	B
HCM 95th-tile Q	6.7	0.6	3.5	16.9	1.9	3.2	0

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	79	420	4	111	972
Future Vol, veh/h	3	79	420	4	111	972
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	9	0	1	3
Mvmt Flow	3	87	462	4	122	1068

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1776	464	0	0	466	0
Stage 1	464	-	-	-	-	-
Stage 2	1312	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	92	602	-	-	1101	-
Stage 1	637	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	82	602	-	-	1101	-
Mov Cap-2 Maneuver	82	-	-	-	-	-
Stage 1	637	-	-	-	-	-
Stage 2	226	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	1101	-
HCM Lane V/C Ratio	-	-	0.184	0.111	-
HCM Control Delay (s)	-	-	14	8.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.4	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	39	2	3	2	421	41	3	985	2
Future Vol, veh/h	1	1	1	39	2	3	2	421	41	3	985	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	1	1	1	46	2	4	2	495	48	4	1159	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1668	1667	1160	1668	1668	495	1161	0	0	495	0	0
Stage 1	1167	1167	-	500	500	-	-	-	-	-	-	-
Stage 2	501	500	-	1168	1168	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	77	97	240	77	97	579	609	-	-	1079	-	-
Stage 1	238	270	-	557	546	-	-	-	-	-	-	-
Stage 2	556	546	-	238	270	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	75	96	240	76	96	579	609	-	-	1079	-	-
Mov Cap-2 Maneuver	75	96	-	76	96	-	-	-	-	-	-	-
Stage 1	237	269	-	555	544	-	-	-	-	-	-	-
Stage 2	548	544	-	235	269	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.4	103.3	0	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	609	-	-	84	240	77	579	1079	-	-
HCM Lane V/C Ratio	0.004	-	-	0.028	0.005	0.626	0.006	0.003	-	-
HCM Control Delay (s)	10.9	-	-	49.1	20.1	110	11.3	8.3	-	-
HCM Lane LOS	B	-	-	E	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	2.8	0	0	-	-

Intersection	
Intersection Delay, s/veh	23.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	22	181	105	26	10	81	175	25	5	288	99
Future Vol, veh/h	97	22	181	105	26	10	81	175	25	5	288	99
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	4	9	6	0	0	0	5	8	4	0	3	8
Mvmt Flow	120	27	223	130	32	12	100	216	31	6	356	122
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	17.8	19.9	20.8	31.5
HCM LOS	C	C	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	82%	0%	74%	100%	0%	0%
Vol Thru, %	0%	88%	18%	0%	18%	0%	100%	0%
Vol Right, %	0%	12%	0%	100%	7%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	200	119	181	141	5	288	99
LT Vol	81	0	97	0	105	5	0	0
Through Vol	0	175	22	0	26	0	288	0
RT Vol	0	25	0	181	10	0	0	99
Lane Flow Rate	100	247	147	223	174	6	356	122
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.254	0.59	0.369	0.495	0.455	0.015	0.813	0.258
Departure Headway (Hd)	9.16	8.603	9.032	7.981	9.419	8.692	8.23	7.595
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	392	420	398	451	383	412	441	473
Service Time	6.913	6.355	6.784	5.732	7.178	6.44	5.977	5.343
HCM Lane V/C Ratio	0.255	0.588	0.369	0.494	0.454	0.015	0.807	0.258
HCM Control Delay	15	23.1	17	18.3	19.9	11.6	38.2	13
HCM Lane LOS	B	C	C	C	C	B	E	B
HCM 95th-tile Q	1	3.7	1.7	2.7	2.3	0	7.5	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	17	290	591	0
Future Vol, veh/h	0	9	17	290	591	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	6	5	0
Mvmt Flow	0	12	23	392	799	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1237	799	799	0	-	0
Stage 1	799	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	196	389	833	-	-	-
Stage 1	446	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	191	389	833	-	-	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	446	-	-	-	-	-
Stage 2	637	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	833	-	389	-	-
HCM Lane V/C Ratio	0.028	-	0.031	-	-
HCM Control Delay (s)	9.4	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	63.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	85	114	193	126	242	358
Future Vol, veh/h	85	114	193	126	242	358
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	0	0	4	2	5	4
Mvmt Flow	120	161	272	177	341	504

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1547	361	0	0	449	0
Stage 1	361	-	-	-	-	-
Stage 2	1186	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	127	688	-	-	1096	-
Stage 1	710	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 87	688	-	-	1096	-
Mov Cap-2 Maneuver	~ 87	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	202	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s$	347.2	0	3.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	174	1096	-
HCM Lane V/C Ratio	-	-	1.611	0.311	-
HCM Control Delay (s)	-	-	$ 347.2	9.8	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	18.9	1.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	67	272	113	150	348
Future Vol, veh/h	30	67	272	113	150	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	0	0	3	1	0	2
Mvmt Flow	50	112	453	188	250	580

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1628	548	0	0	642	0
Stage 1	548	-	-	-	-	-
Stage 2	1080	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	113	540	-	-	952	-
Stage 1	583	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	83	540	-	-	952	-
Mov Cap-2 Maneuver	83	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	243	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	40	0	3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	83	540	952	-
HCM Lane V/C Ratio	-	-	0.602	0.207	0.263	-
HCM Control Delay (s)	-	-	99.5	13.4	10.1	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	2.7	0.8	1.1	-

Intersection	
Int Delay, s/veh	81.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	127	0	103	3	282	129	109	265	4
Future Vol, veh/h	0	0	3	127	0	103	3	282	129	109	265	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	2	0
Mvmt Flow	0	0	4	187	0	151	4	415	190	160	390	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1307	1326	393	1233	1234	510	396	0	0	604	0	0
Stage 1	713	713	-	518	518	-	-	-	-	-	-	-
Stage 2	594	613	-	715	716	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	138	157	660	~ 155	178	567	1174	-	-	984	-	-
Stage 1	426	438	-	544	536	-	-	-	-	-	-	-
Stage 2	495	486	-	425	437	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	131	660	~ 134	149	567	1174	-	-	984	-	-
Mov Cap-2 Maneuver	88	131	-	~ 134	149	-	-	-	-	-	-	-
Stage 1	425	367	-	542	534	-	-	-	-	-	-	-
Stage 2	362	484	-	354	366	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	$ 358	0.1	2.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1174	-	-	660	204	984	-	-
HCM Lane V/C Ratio	0.004	-	-	0.007	1.658	0.163	-	-
HCM Control Delay (s)	8.1	-	-	10.5	$ 358	9.4	-	-
HCM Lane LOS	A	-	-	B	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	22.4	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	9.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	161	60	354	304	111	284
Future Vol, veh/h	161	60	354	304	111	284
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	3	1	1	2
Mvmt Flow	218	81	478	411	150	384

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1368	684	0	0	889	0
Stage 1	684	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	~ 163	452	-	-	766	-
Stage 1	505	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 131	452	-	-	766	-
Mov Cap-2 Maneuver	264	-	-	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	406	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	48	0	3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	264	452	766	-
HCM Lane V/C Ratio	-	-	0.824	0.179	0.196	-
HCM Control Delay (s)	-	-	60.4	14.7	10.8	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	6.6	0.6	0.7	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	39	56	640	465	0
Future Vol, veh/h	1	39	56	640	465	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	19	9	3	3	0
Mvmt Flow	1	53	76	865	628	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1644	628	628	0	-	0
Stage 1	628	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Critical Hdwy	6.4	6.39	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.471	2.281	-	-	-
Pot Cap-1 Maneuver	111	454	921	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	102	454	921	-	-	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	324	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	921	-	443	-	-
HCM Lane V/C Ratio	0.082	-	0.122	-	-
HCM Control Delay (s)	9.3	-	14.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	189	1	1	15	141	746	5	22	633	20
Future Vol, veh/h	0	0	189	1	1	15	141	746	5	22	633	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	7	3	4	0	0	6	20
Mvmt Flow	0	0	199	1	1	16	148	785	5	23	666	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	666	1798	1798	788	666	0	0	791	0	0
Stage 1	-	-	-	1085	1085	-	-	-	-	-	-	-
Stage 2	-	-	-	713	713	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.1	6.5	6.27	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.5	4	3.363	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	459	63	81	383	919	-	-	838	-	-
Stage 1	0	0	-	265	295	-	-	-	-	-	-	-
Stage 2	0	0	-	426	438	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	459	31	66	383	919	-	-	838	-	-
Mov Cap-2 Maneuver	-	-	-	31	66	-	-	-	-	-	-	-
Stage 1	-	-	-	222	247	-	-	-	-	-	-	-
Stage 2	-	-	-	235	426	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	25.2	1.5	0.3
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	919	-	-	459	196	838	-	-
HCM Lane V/C Ratio	0.162	-	-	0.433	0.091	0.028	-	-
HCM Control Delay (s)	9.7	-	-	18.7	25.2	9.4	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	2.2	0.3	0.1	-	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	122	413	150	105	49	352	409	180	48	353	87
Future Volume (veh/h)	63	122	413	150	105	49	352	409	180	48	353	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1845	1827	1814	1900	1759	1845	1845	1863	1823	1900
Adj Flow Rate, veh/h	71	137	464	169	118	55	396	460	202	54	397	98
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	4	3	4	6	6	8	3	3	2	5	5
Cap, veh/h	460	488	410	243	163	76	408	714	598	69	486	118
Arrive On Green	0.27	0.27	0.27	0.14	0.14	0.14	0.24	0.39	0.39	0.04	0.18	0.18
Sat Flow, veh/h	1723	1827	1534	1740	1164	543	1675	1845	1546	1774	2730	665
Grp Volume(v), veh/h	71	137	464	169	0	173	396	460	202	54	250	245
Grp Sat Flow(s),veh/h/ln	1723	1827	1534	1740	0	1707	1675	1845	1546	1774	1732	1663
Q Serve(g_s), s	3.3	6.2	28.0	9.7	0.0	10.2	24.5	21.3	9.7	3.2	14.5	14.9
Cycle Q Clear(g_c), s	3.3	6.2	28.0	9.7	0.0	10.2	24.5	21.3	9.7	3.2	14.5	14.9
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	460	488	410	243	0	238	408	714	598	69	309	296
V/C Ratio(X)	0.15	0.28	1.13	0.70	0.00	0.73	0.97	0.64	0.34	0.78	0.81	0.83
Avail Cap(c_a), veh/h	460	488	410	465	0	456	408	714	598	102	339	325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	30.4	38.4	43.0	0.0	43.2	39.3	26.2	22.6	49.9	41.4	41.5
Incr Delay (d2), s/veh	0.1	0.1	85.6	1.3	0.0	1.6	37.0	1.6	0.1	11.4	11.3	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	3.2	21.6	4.7	0.0	4.9	15.5	11.2	4.1	1.8	7.9	7.9
LnGrp Delay(d),s/veh	29.4	30.5	124.1	44.3	0.0	44.7	76.3	27.8	22.8	61.3	52.7	55.1
LnGrp LOS	C	C	F	D		D	E	C	C	E	D	E
Approach Vol, veh/h		672			342			1058			549	
Approach Delay, s/veh		95.0			44.5			45.0			54.6	
Approach LOS		F			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	46.1		32.0	30.0	24.2		18.6
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	6.0	40.5		28.0	25.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	5.2	23.3		30.0	26.5	16.9		12.2
Green Ext Time (p_c), s	0.0	4.2		0.0	0.0	1.6		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	59.8
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	27	16	71	14	450	22	645	80	388	682	12
Future Volume (veh/h)	11	27	16	71	14	450	22	645	80	388	682	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1839	1845	1900	1845	1827	1863	1863	1900
Adj Flow Rate, veh/h	12	29	17	76	15	479	23	686	85	413	726	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	3	0	3	4	2	2	2
Cap, veh/h	92	200	100	325	58	727	28	733	611	447	1157	21
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.02	0.40	0.40	0.25	0.63	0.63
Sat Flow, veh/h	195	939	470	1171	270	1561	1810	1845	1537	1774	1824	33
Grp Volume(v), veh/h	58	0	0	91	0	479	23	686	85	413	0	739
Grp Sat Flow(s),veh/h/ln	1604	0	0	1441	0	1561	1810	1845	1537	1774	0	1857
Q Serve(g_s), s	0.0	0.0	0.0	1.8	0.0	18.5	1.1	31.0	3.1	19.7	0.0	21.0
Cycle Q Clear(g_c), s	2.3	0.0	0.0	4.1	0.0	18.5	1.1	31.0	3.1	19.7	0.0	21.0
Prop In Lane	0.21		0.29	0.84		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	391	0	0	383	0	727	28	733	611	447	0	1177
V/C Ratio(X)	0.15	0.00	0.00	0.24	0.00	0.66	0.84	0.94	0.14	0.92	0.00	0.63
Avail Cap(c_a), veh/h	391	0	0	383	0	727	114	774	645	469	0	1177
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.8	0.0	0.0	28.5	0.0	18.0	42.7	25.1	16.7	31.7	0.0	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	2.2	20.8	18.1	0.1	23.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	1.9	0.0	9.3	0.7	19.3	1.3	12.5	0.0	11.0
LnGrp Delay(d),s/veh	28.0	0.0	0.0	28.8	0.0	20.2	63.5	43.2	16.8	55.1	0.0	10.7
LnGrp LOS	C			C		C	E	D	B	E		B
Approach Vol, veh/h		58			570			794			1152	
Approach Delay, s/veh		28.0			21.6			41.0			26.6	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.9	38.6		22.5	5.3	59.1		22.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	23.0	36.5		18.5	5.5	54.0		18.5
Max Q Clear Time (g_c+I1), s	21.7	33.0		4.3	3.1	23.0		20.5
Green Ext Time (p_c), s	0.2	1.5		2.4	0.0	13.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Future Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1869	1900	1881	1876	1900	1827	1853	1900	1900	1845	1863
Adj Flow Rate, veh/h	63	52	81	112	37	64	112	472	134	49	203	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	0	0	4	3	3	0	3	2
Cap, veh/h	136	112	221	250	86	149	158	812	229	96	483	414
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.09	0.30	0.30	0.05	0.26	0.00
Sat Flow, veh/h	997	823	1615	1792	618	1069	1740	2713	765	1810	1845	1583
Grp Volume(v), veh/h	115	0	81	112	0	101	112	305	301	49	203	0
Grp Sat Flow(s),veh/h/ln	1819	0	1615	1792	0	1688	1740	1760	1718	1810	1845	1583
Q Serve(g_s), s	2.2	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Cycle Q Clear(g_c), s	2.2	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Prop In Lane	0.55		1.00	1.00		0.63	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	249	0	221	250	0	236	158	527	514	96	483	414
V/C Ratio(X)	0.46	0.00	0.37	0.45	0.00	0.43	0.71	0.58	0.59	0.51	0.42	0.00
Avail Cap(c_a), veh/h	1204	0	1069	856	0	806	881	1590	1552	329	1068	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.3	0.0	15.1	15.2	0.0	15.2	17.0	11.4	11.5	17.8	11.8	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.4	0.5	0.0	0.5	2.2	0.5	0.6	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.8	1.1	0.0	1.0	1.2	2.8	2.8	0.5	1.8	0.0
LnGrp Delay(d),s/veh	15.8	0.0	15.5	15.7	0.0	15.6	19.2	12.0	12.0	19.3	12.1	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		196			213			718			252	
Approach Delay, s/veh		15.7			15.6			13.1			13.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	15.2		8.8	6.5	13.8		9.5
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	7.0	34.8		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	3.0	7.7		4.2	4.4	5.5		4.2
Green Ext Time (p_c), s	0.0	3.8		0.4	0.1	3.4		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	30.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	122	426	249	88	123	249
Future Vol, veh/h	122	426	249	88	123	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	3	3	2	4	1
Mvmt Flow	131	458	268	95	132	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	800	268	0	0	268	0
Stage 1	268	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.41	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	356	768	-	-	1284	-
Stage 1	779	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	313	768	-	-	1284	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.2	0	2.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	580	1284	-
HCM Lane V/C Ratio	-	-	1.016	0.103	-
HCM Control Delay (s)	-	-	68.2	8.1	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	15.5	0.3	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	184	44	55	211	59	84
Future Vol, veh/h	184	44	55	211	59	84
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	6	5	4
Mvmt Flow	200	48	60	229	64	91

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	248	0	573	224
Stage 1	-	-	-	-	224	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	-	-	4.12	-	6.45	6.24
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.336
Pot Cap-1 Maneuver	-	-	1318	-	476	810
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1318	-	451	810
Mov Cap-2 Maneuver	-	-	-	-	451	-
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	670	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	610	-	-	1318	-
HCM Lane V/C Ratio	0.255	-	-	0.045	-
HCM Control Delay (s)	12.9	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	282	162	464	303	44	140	1122	433	23	751	161
Future Volume (veh/h)	189	282	162	464	303	44	140	1122	433	23	751	161
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1827	1845	1845	1863	1810	1810	1881	1845	1743	1863	1810
Adj Flow Rate, veh/h	212	317	182	521	340	49	157	1261	487	26	844	181
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	4	3	3	2	5	5	1	3	9	2	5
Cap, veh/h	246	411	353	560	470	383	182	1360	854	35	1046	666
Arrive On Green	0.14	0.23	0.23	0.16	0.25	0.25	0.11	0.38	0.38	0.02	0.30	0.30
Sat Flow, veh/h	1792	1827	1568	3408	1863	1518	1723	3574	1568	1660	3539	1538
Grp Volume(v), veh/h	212	317	182	521	340	49	157	1261	487	26	844	181
Grp Sat Flow(s),veh/h/ln	1792	1827	1568	1704	1863	1518	1723	1787	1568	1660	1770	1538
Q Serve(g_s), s	11.1	15.5	9.7	14.4	15.9	2.4	8.6	32.3	19.6	1.5	21.1	7.2
Cycle Q Clear(g_c), s	11.1	15.5	9.7	14.4	15.9	2.4	8.6	32.3	19.6	1.5	21.1	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	411	353	560	470	383	182	1360	854	35	1046	666
V/C Ratio(X)	0.86	0.77	0.52	0.93	0.72	0.13	0.86	0.93	0.57	0.75	0.81	0.27
Avail Cap(c_a), veh/h	272	459	394	560	491	401	182	1360	854	87	1119	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	34.7	32.5	39.4	32.7	27.6	42.0	28.3	14.4	46.5	31.1	17.4
Incr Delay (d2), s/veh	22.2	9.1	2.5	22.3	6.4	0.3	31.9	11.5	1.5	27.2	5.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	8.9	4.4	8.5	9.0	1.0	5.7	17.9	8.8	0.9	11.0	3.2
LnGrp Delay(d),s/veh	62.5	43.8	34.9	61.7	39.1	27.9	73.9	39.9	15.9	73.7	36.1	17.9
LnGrp LOS	E	D	C	E	D	C	E	D	B	E	D	B
Approach Vol, veh/h		711			910			1905			1051	
Approach Delay, s/veh		47.1			51.4			36.5			33.9	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	41.8	20.2	27.0	14.6	33.7	17.6	29.6
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	35.3	15.7	24.0	10.1	30.2	14.5	25.2
Max Q Clear Time (g_c+I1), s	3.5	34.3	16.4	17.5	10.6	23.1	13.1	17.9
Green Ext Time (p_c), s	0.0	1.0	0.0	4.0	0.0	5.2	0.1	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	40.5
HCM 2010 LOS	D

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	199	0	121	0	1576	188	108	1269	0
Future Volume (vph)	0	0	142	199	0	121	0	1576	188	108	1269	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.98		1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1602	1764		1553		3490		1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1602	1764		1553		3490		1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	207	0	126	0	1642	196	112	1322	0
RTOR Reduction (vph)	0	0	74	0	0	104	0	11	0	0	0	0
Lane Group Flow (vph)	0	0	74	207	0	22	0	1827	0	113	1322	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	Perm
Protected Phases								6		5	2	
Permitted Phases			4	8		8						2
Actuated Green, G (s)			13.5	13.5		13.5		45.5		5.9	55.4	
Effective Green, g (s)			13.5	13.5		13.5		45.5		5.9	55.4	
Actuated g/C Ratio			0.17	0.17		0.17		0.58		0.08	0.71	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			275	303		267		2025		134	2500	
v/s Ratio Prot								c0.52		c0.06	0.37	
v/s Ratio Perm			0.05	c0.12		0.01						
v/c Ratio			0.27	0.68		0.08		0.90		0.84	0.53	
Uniform Delay, d1			28.2	30.4		27.2		14.5		35.8	5.4	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			0.5	6.8		0.2		6.2		34.5	0.3	
Delay (s)			28.7	37.2		27.4		20.7		70.3	5.7	
Level of Service			C	D		C		C		E	A	
Approach Delay (s)		28.7			33.5			20.7			10.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	78.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	188	26	368	107	24	33	358	1566	69	61	1451	117
Future Volume (veh/h)	188	26	368	107	24	33	358	1566	69	61	1451	117
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1863	1863	1863	1881
Adj Flow Rate, veh/h	200	28	391	114	26	35	381	1666	73	65	1544	124
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	190	302	452	137	254	212	348	2061	921	83	1510	673
Arrive On Green	0.10	0.17	0.17	0.08	0.14	0.14	0.20	0.58	0.58	0.05	0.43	0.43
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	3539	1582	1774	3539	1577
Grp Volume(v), veh/h	200	28	391	114	26	35	381	1666	73	65	1544	124
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1770	1582	1774	1770	1577
Q Serve(g_s), s	14.0	1.7	18.6	8.5	1.7	2.7	27.0	49.6	2.7	4.8	57.0	6.5
Cycle Q Clear(g_c), s	14.0	1.7	18.6	8.5	1.7	2.7	27.0	49.6	2.7	4.8	57.0	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	302	452	137	254	212	348	2061	921	83	1510	673
V/C Ratio(X)	1.05	0.09	0.86	0.83	0.10	0.17	1.09	0.81	0.08	0.78	1.02	0.18
Avail Cap(c_a), veh/h	190	421	630	174	410	342	348	2061	921	104	1510	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.8	47.2	54.3	60.7	50.2	50.7	53.3	22.0	12.2	63.0	38.3	23.8
Incr Delay (d2), s/veh	80.5	0.1	8.9	22.7	0.2	0.4	75.7	2.8	0.1	26.0	28.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	0.9	7.6	5.0	0.9	1.2	20.1	24.9	1.2	3.0	33.8	2.9
LnGrp Delay(d),s/veh	140.2	47.4	63.2	83.4	50.4	51.0	129.0	24.9	12.3	88.9	67.2	24.1
LnGrp LOS	F	D	E	F	D	D	F	C	B	F	F	C
Approach Vol, veh/h		619			175			2120			1733	
Approach Delay, s/veh		87.4			72.0			43.1			64.9	
Approach LOS		F			E			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	82.8	14.4	26.1	31.0	62.0	18.0	22.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.8	76.2	13.2	30.8	27.0	57.0	14.0	30.0
Max Q Clear Time (g_c+I1), s	6.8	51.6	10.5	20.6	29.0	59.0	16.0	4.7
Green Ext Time (p_c), s	0.0	24.4	0.1	1.5	0.0	0.0	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	58.2
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	0	307	556	137	328	418	1506	392	0	1707	209
Future Volume (veh/h)	200	0	307	556	137	328	418	1506	392	0	1707	209
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1839	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	213	0	327	591	298	248	445	1602	417	0	1816	222
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	174	0	0	1076	325	272	469	3121	981	0	1550	506
Arrive On Green	0.10	0.00	0.00	0.31	0.18	0.18	0.52	1.00	1.00	0.00	0.32	0.32
Sat Flow, veh/h	1810	213		3514	1839	1538	1792	5036	1583	0	5055	1599
Grp Volume(v), veh/h	213	209.8		591	298	248	445	1602	417	0	1816	222
Grp Sat Flow(s),veh/h/ln	1810	F		1757	1839	1538	1792	1679	1583	0	1631	1599
Q Serve(g_s), s	14.4			21.0	23.9	23.7	35.3	0.0	0.0	0.0	47.5	16.5
Cycle Q Clear(g_c), s	14.4			21.0	23.9	23.7	35.3	0.0	0.0	0.0	47.5	16.5
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	174			1076	325	272	469	3121	981	0	1550	506
V/C Ratio(X)	1.23			0.55	0.92	0.91	0.95	0.51	0.42	0.00	1.17	0.44
Avail Cap(c_a), veh/h	174			1368	478	400	469	3121	981	0	1550	506
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.37	0.37
Uniform Delay (d), s/veh	67.8			43.4	60.6	60.6	34.8	0.0	0.0	0.0	51.3	40.7
Incr Delay (d2), s/veh	142.0			0.2	13.6	14.9	28.7	0.6	1.3	0.0	80.2	1.0
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0			10.2	13.4	11.3	21.0	0.2	0.4	0.0	32.9	7.5
LnGrp Delay(d),s/veh	209.8			43.6	74.2	75.5	63.5	0.6	1.3	0.0	131.4	41.7
LnGrp LOS	F			D	E	E	E	A	A		F	D
Approach Vol, veh/h					1137			2464			2038	
Approach Delay, s/veh					58.6			12.1			121.7	
Approach LOS					E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		99.2	50.8		45.5	53.7	19.0	31.8
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		80.5	58.4		28.3	* 48	14.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	23.0		37.3	49.5	16.4	25.9
Green Ext Time (p_c), s		6.3	0.4		0.0	0.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	66.5
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	624	276	151	199	0	464	0	1823	177	393	1207	460
Future Volume (veh/h)	624	276	151	199	0	464	0	1823	177	393	1207	460
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1881	0	1881	0	1827	1900	1881	1845	1881
Adj Flow Rate, veh/h	657	291	159	209	0	488	0	1919	186	414	1271	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	1	0	1	0	4	0	1	3	1
Cap, veh/h	919	430	188	210	0	0	0	2000	514	1048	2317	1057
Arrive On Green	0.27	0.12	0.12	0.12	0.00	0.00	0.00	0.32	0.32	0.60	1.00	0.00
Sat Flow, veh/h	3442	3610	1583	1792	209		0	6540	1615	3476	3505	1599
Grp Volume(v), veh/h	657	291	159	209	126.4		0	1919	186	414	1271	0
Grp Sat Flow(s),veh/h/ln	1721	1805	1583	1792	F		0	1571	1615	1738	1752	1599
Q Serve(g_s), s	25.9	11.6	14.8	17.5			0.0	45.0	9.6	9.3	0.0	0.0
Cycle Q Clear(g_c), s	25.9	11.6	14.8	17.5			0.0	45.0	9.6	9.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	919	430	188	210			0	2000	514	1048	2317	1057
V/C Ratio(X)	0.72	0.68	0.84	0.99			0.00	0.96	0.36	0.40	0.55	0.00
Avail Cap(c_a), veh/h	919	1011	443	210			0	2011	517	1048	2317	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.84	0.84	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.8	63.3	64.7	66.1			0.0	50.2	20.6	22.7	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.7	3.9	60.3			0.0	11.2	1.7	0.1	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.6	5.8	6.7	12.2			0.0	21.0	4.5	4.4	0.3	0.0
LnGrp Delay(d),s/veh	52.3	64.0	68.6	126.4			0.0	61.4	22.2	22.7	0.9	0.0
LnGrp LOS	D	E	E	F				E	C	C	A	
Approach Vol, veh/h		1107						2105			1685	
Approach Delay, s/veh		57.7						57.9			6.3	
Approach LOS		E						E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	51.4	53.9	22.2	22.4		105.4	44.6	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	22.4	* 48	17.6	42.0		75.0	37.9	
Max Q Clear Time (g_c+I1), s	11.3	47.0	19.5	16.8		2.0	27.9	
Green Ext Time (p_c), s	3.6	0.8	0.0	1.1		4.5	2.2	

Intersection Summary	
HCM 2010 Ctrl Delay	43.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	0	51	75	0	156	48	1749	194	0	1360	90
Future Volume (veh/h)	97	0	51	75	0	156	48	1749	194	0	1360	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1900	1881	1863	1863	1900	0	1863	1863
Adj Flow Rate, veh/h	105	0	55	82	0	170	52	1901	211	0	1478	98
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	1	2	2	2	0	2	2
Cap, veh/h	143	0	128	232	0	205	68	3870	429	0	2028	907
Arrive On Green	0.08	0.00	0.08	0.13	0.00	0.13	0.04	0.66	0.66	0.00	0.57	0.57
Sat Flow, veh/h	1774	0	1583	1810	0	1599	1774	5898	654	0	3632	1583
Grp Volume(v), veh/h	105	0	55	82	0	170	52	1549	563	0	1478	98
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1810	0	1599	1774	1602	1747	0	1770	1583
Q Serve(g_s), s	5.8	0.0	3.3	4.1	0.0	10.4	2.9	16.4	16.4	0.0	30.6	2.8
Cycle Q Clear(g_c), s	5.8	0.0	3.3	4.1	0.0	10.4	2.9	16.4	16.4	0.0	30.6	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	0.00		1.00
Lane Grp Cap(c), veh/h	143	0	128	232	0	205	68	3153	1146	0	2028	907
V/C Ratio(X)	0.73	0.00	0.43	0.35	0.00	0.83	0.77	0.49	0.49	0.00	0.73	0.11
Avail Cap(c_a), veh/h	319	0	285	326	0	288	89	3153	1146	0	2028	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.70	0.70	0.70	0.00	0.76	0.76
Uniform Delay (d), s/veh	44.9	0.0	43.8	39.8	0.0	42.5	47.6	8.7	8.7	0.0	15.7	9.7
Incr Delay (d2), s/veh	7.1	0.0	2.3	0.9	0.0	13.0	18.3	0.4	1.1	0.0	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	1.5	2.1	0.0	5.3	1.8	7.3	8.2	0.0	15.3	1.3
LnGrp Delay(d),s/veh	52.0	0.0	46.1	40.7	0.0	55.5	65.9	9.1	9.8	0.0	17.5	9.9
LnGrp LOS	D		D	D		E	E	A	A		B	A
Approach Vol, veh/h		160			252			2164			1576	
Approach Delay, s/veh		50.0			50.7			10.6			17.0	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		70.1		12.6	8.3	61.8		17.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		50.5		18.0	5.0	41.0		18.0
Max Q Clear Time (g_c+I1), s		18.4		7.8	4.9	32.6		12.4
Green Ext Time (p_c), s		30.1		0.4	0.0	8.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	1	107	0	70	2	1916	85	80	1407	1
Future Volume (veh/h)	5	0	1	107	0	70	2	1916	85	80	1407	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1776	1900	1900	1900	1863	1863	1696	1881	1900
Adj Flow Rate, veh/h	5	0	1	116	0	76	2	2083	92	87	1529	1
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	7	0	0	0	2	2	12	1	0
Cap, veh/h	12	0	8	206	116	98	5	2998	933	108	2336	1055
Arrive On Green	0.01	0.00	0.00	0.06	0.00	0.06	0.00	0.59	0.59	0.07	0.65	0.65
Sat Flow, veh/h	1810	0	1615	3281	1900	1615	1810	5085	1582	1616	3574	1614
Grp Volume(v), veh/h	5	0	1	116	0	76	2	2083	92	87	1529	1
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1640	1900	1615	1810	1695	1582	1616	1787	1614
Q Serve(g_s), s	0.2	0.0	0.0	2.5	0.0	3.3	0.1	20.4	1.8	3.8	18.6	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	2.5	0.0	3.3	0.1	20.4	1.8	3.8	18.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	12	0	8	206	116	98	5	2998	933	108	2336	1055
V/C Ratio(X)	0.42	0.00	0.13	0.56	0.00	0.77	0.41	0.69	0.10	0.81	0.65	0.00
Avail Cap(c_a), veh/h	126	0	712	384	928	789	126	3115	969	142	2336	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	35.5	32.6	0.0	33.2	35.7	10.2	6.4	33.0	7.5	4.3
Incr Delay (d2), s/veh	21.6	0.0	9.3	2.4	0.0	14.3	46.0	0.7	0.1	21.8	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.2	0.0	1.9	0.1	9.6	0.8	2.3	9.1	0.0
LnGrp Delay(d),s/veh	57.0	0.0	44.8	35.0	0.0	47.4	81.7	10.9	6.5	54.8	8.2	4.3
LnGrp LOS	E		D	D		D	F	B	A	D	A	A
Approach Vol, veh/h		6			192			2177			1617	
Approach Delay, s/veh		55.0			39.9			10.8			10.7	
Approach LOS		E			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	48.1	9.0	5.3	4.7	52.6	5.0	9.4
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	6.3	43.9	8.4	31.6	5.0	45.2	5.0	35.0
Max Q Clear Time (g_c+I1), s	5.8	22.4	4.5	2.0	2.1	20.6	2.2	5.3
Green Ext Time (p_c), s	0.0	19.8	0.1	0.3	0.0	24.0	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	74	26	1795	1402	67
Future Volume (veh/h)	119	74	26	1795	1402	67
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1864	1900
Adj Flow Rate, veh/h	125	78	27	1889	1476	71
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2
Cap, veh/h	310	143	56	2563	3038	146
Arrive On Green	0.09	0.09	0.03	0.72	0.61	0.61
Sat Flow, veh/h	3510	1615	1810	3632	5144	239
Grp Volume(v), veh/h	125	78	27	1889	1007	540
Grp Sat Flow(s),veh/h/ln	1755	1615	1810	1770	1697	1822
Q Serve(g_s), s	1.8	2.5	0.8	17.2	8.9	8.9
Cycle Q Clear(g_c), s	1.8	2.5	0.8	17.2	8.9	8.9
Prop In Lane	1.00	1.00	1.00			0.13
Lane Grp Cap(c), veh/h	310	143	56	2563	2072	1112
V/C Ratio(X)	0.40	0.55	0.48	0.74	0.49	0.49
Avail Cap(c_a), veh/h	1194	549	173	2688	2072	1112
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	23.7	25.9	4.4	5.9	5.9
Incr Delay (d2), s/veh	0.8	3.2	6.4	1.1	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.2	0.5	8.5	4.1	4.5
LnGrp Delay(d),s/veh	24.3	27.0	32.3	5.5	6.1	6.3
LnGrp LOS	C	C	C	A	A	A
Approach Vol, veh/h	203			1916	1547	
Approach Delay, s/veh	25.3			5.9	6.1	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.3	6.2	38.9				45.1
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	5.2	31.6				41.3
Max Q Clear Time (g_c+I1), s		4.5	2.8	10.9				19.2
Green Ext Time (p_c), s		0.5	0.0	20.0				20.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	412	411	70	340	220	406	1317	74	210	994	281
Future Volume (veh/h)	380	412	411	70	340	220	406	1317	74	210	994	281
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1845	1900	1900	1810	1900	1863	1863	1900	1863	1863	1845
Adj Flow Rate, veh/h	409	443	442	75	366	237	437	1416	80	226	1069	302
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	0	0	5	5	2	2	2	2	2	3
Cap, veh/h	372	1036	473	95	280	178	515	1337	75	210	1839	556
Arrive On Green	0.21	0.30	0.30	0.05	0.14	0.14	0.15	0.39	0.39	0.12	0.36	0.36
Sat Flow, veh/h	1792	3505	1599	1810	1989	1263	3442	3405	192	1774	5085	1537
Grp Volume(v), veh/h	409	443	442	75	315	288	437	734	762	226	1069	302
Grp Sat Flow(s),veh/h/ln	1792	1752	1599	1810	1719	1534	1721	1770	1827	1774	1695	1537
Q Serve(g_s), s	28.0	13.8	36.3	5.5	19.0	19.0	16.7	53.0	53.0	16.0	22.9	21.1
Cycle Q Clear(g_c), s	28.0	13.8	36.3	5.5	19.0	19.0	16.7	53.0	53.0	16.0	22.9	21.1
Prop In Lane	1.00		1.00	1.00		0.82	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	372	1036	473	95	242	216	515	695	717	210	1839	556
V/C Ratio(X)	1.10	0.43	0.94	0.79	1.30	1.33	0.85	1.06	1.06	1.07	0.58	0.54
Avail Cap(c_a), veh/h	372	1036	473	121	242	216	612	695	717	210	1839	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	38.3	46.3	63.2	58.0	58.0	55.9	41.0	41.0	59.5	34.8	34.2
Incr Delay (d2), s/veh	76.6	1.0	27.5	23.1	163.3	177.9	11.6	50.0	51.4	83.4	0.6	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.7	6.8	19.6	3.4	20.0	18.7	8.8	35.5	36.9	12.7	10.8	9.1
LnGrp Delay(d),s/veh	130.1	39.4	73.8	86.3	221.3	235.9	67.6	91.0	92.4	142.9	35.4	35.7
LnGrp LOS	F	D	E	F	F	F	E	F	F	F	D	D
Approach Vol, veh/h		1294			678			1933			1597	
Approach Delay, s/veh		79.8			212.5			86.2			50.7	
Approach LOS		E			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	58.0	11.1	45.9	24.2	53.8	32.0	25.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	16.0	53.0	9.0	38.0	24.0	45.0	28.0	19.0
Max Q Clear Time (g_c+I1), s	18.0	55.0	7.5	38.3	18.7	24.9	30.0	21.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	1.5	19.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	90.0
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	34	181	102	34	46	152	632	119	41	519	36
Future Volume (veh/h)	64	34	181	102	34	46	152	632	119	41	519	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1737	1845	1900	1743	1792	1681	1848	1900	1900	1827	1624
Adj Flow Rate, veh/h	70	37	199	112	37	51	167	695	131	45	570	40
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	12	12	3	9	9	6	13	3	3	0	4	17
Cap, veh/h	68	21	464	72	13	451	199	763	144	69	765	565
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.12	0.50	0.50	0.04	0.42	0.42
Sat Flow, veh/h	0	71	1565	0	44	1521	1601	1512	285	1810	1827	1350
Grp Volume(v), veh/h	107	0	199	149	0	51	167	0	826	45	570	40
Grp Sat Flow(s),veh/h/ln	71	0	1565	44	0	1521	1601	0	1797	1810	1827	1350
Q Serve(g_s), s	0.0	0.0	8.9	0.0	0.0	2.1	8.9	0.0	36.8	2.1	23.0	1.5
Cycle Q Clear(g_c), s	25.9	0.0	8.9	25.9	0.0	2.1	8.9	0.0	36.8	2.1	23.0	1.5
Prop In Lane	0.65		1.00	0.75		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	89	0	464	85	0	451	199	0	907	69	765	565
V/C Ratio(X)	1.20	0.00	0.43	1.74	0.00	0.11	0.84	0.00	0.91	0.65	0.74	0.07
Avail Cap(c_a), veh/h	89	0	464	85	0	451	240	0	918	114	774	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	0.0	24.7	39.7	0.0	22.3	37.4	0.0	19.8	41.4	21.4	15.2
Incr Delay (d2), s/veh	158.2	0.0	0.7	378.4	0.0	0.1	20.3	0.0	13.8	11.6	5.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	3.9	11.0	0.0	0.9	5.1	0.0	21.6	1.3	12.7	0.6
LnGrp Delay(d),s/veh	195.8	0.0	25.5	418.1	0.0	22.5	57.7	0.0	33.6	53.0	26.6	15.3
LnGrp LOS	F		C	F		C	E		C	D	C	B
Approach Vol, veh/h		306			200			993			655	
Approach Delay, s/veh		85.0			317.2			37.7			27.7	
Approach LOS		F			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	49.5		30.4	14.9	42.0		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.5	44.6		25.9	13.1	37.0		25.9
Max Q Clear Time (g_c+I1), s	4.1	38.8		27.9	10.9	25.0		27.9
Green Ext Time (p_c), s	0.0	5.3		0.0	0.1	10.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	67.3
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	141	22	806	160	380	43	811	736	205	729	26
Future Volume (veh/h)	32	141	22	806	160	380	43	811	736	205	729	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1836	1900	1881	1869	1900	1900	1845	1881	1900	1861	1900
Adj Flow Rate, veh/h	34	150	23	978	0	404	46	863	783	218	776	28
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	1	3	0	0	3	1	0	2	2
Cap, veh/h	146	254	38	1059	0	475	60	1281	584	207	1554	56
Arrive On Green	0.08	0.08	0.08	0.30	0.00	0.30	0.03	0.37	0.37	0.11	0.45	0.45
Sat Flow, veh/h	1740	3034	456	3583	0	1607	1810	3505	1596	1810	3478	125
Grp Volume(v), veh/h	34	85	88	978	0	404	46	863	783	218	394	410
Grp Sat Flow(s),veh/h/ln	1740	1744	1746	1792	0	1607	1810	1752	1596	1810	1768	1835
Q Serve(g_s), s	2.4	6.2	6.4	34.7	0.0	31.1	3.3	27.2	48.0	15.0	20.9	20.9
Cycle Q Clear(g_c), s	2.4	6.2	6.4	34.7	0.0	31.1	3.3	27.2	48.0	15.0	20.9	20.9
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	146	146	146	1059	0	475	60	1281	584	207	790	820
V/C Ratio(X)	0.23	0.58	0.60	0.92	0.00	0.85	0.77	0.67	1.34	1.05	0.50	0.50
Avail Cap(c_a), veh/h	371	372	372	1105	0	496	124	1281	584	207	790	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.2	57.9	58.0	44.8	0.0	43.5	63.0	35.1	41.7	58.2	25.9	25.9
Incr Delay (d2), s/veh	0.8	3.6	3.9	12.4	0.0	12.9	18.5	1.6	165.1	77.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.1	3.2	18.9	0.0	15.4	2.0	13.5	47.8	11.9	10.3	10.7
LnGrp Delay(d),s/veh	57.0	61.6	62.0	57.2	0.0	56.4	81.5	36.6	206.7	135.9	26.6	26.5
LnGrp LOS	E	E	E	E		E	F	D	F	F	C	C
Approach Vol, veh/h		207			1382			1692			1022	
Approach Delay, s/veh		61.0			56.9			116.6			49.9	
Approach LOS		E			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.0	53.0		16.0	8.3	63.7		43.3
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	15.0	48.0		28.0	9.0	54.0		40.5
Max Q Clear Time (g_c+I1), s	17.0	50.0		8.4	5.3	22.9		36.7
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	25.2		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	78.9
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	945	14	36	1168	523	49	19	11	531	19	280
Future Volume (veh/h)	259	945	14	36	1168	523	49	19	11	531	19	280
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1845	1881	1776	1900	1900	1900	1863	1865	1900
Adj Flow Rate, veh/h	270	984	15	38	1217	0	51	20	11	567	0	292
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	3	1	7	0	0	0	2	0	0
Cap, veh/h	293	1724	26	48	1228	518	124	79	43	832	0	377
Arrive On Green	0.16	0.48	0.48	0.03	0.34	0.00	0.07	0.07	0.07	0.23	0.00	0.23
Sat Flow, veh/h	1810	3604	55	1757	3574	1509	1810	1146	630	3548	0	1607
Grp Volume(v), veh/h	270	488	511	38	1217	0	51	0	31	567	0	292
Grp Sat Flow(s),veh/h/ln	1810	1787	1872	1757	1787	1509	1810	0	1776	1774	0	1607
Q Serve(g_s), s	15.0	20.0	20.0	2.2	34.5	0.0	2.8	0.0	1.7	14.8	0.0	17.3
Cycle Q Clear(g_c), s	15.0	20.0	20.0	2.2	34.5	0.0	2.8	0.0	1.7	14.8	0.0	17.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	293	855	895	48	1228	518	124	0	122	832	0	377
V/C Ratio(X)	0.92	0.57	0.57	0.80	0.99	0.00	0.41	0.00	0.25	0.68	0.00	0.77
Avail Cap(c_a), veh/h	293	855	895	116	1228	518	124	0	122	1114	0	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.1	19.1	19.1	49.3	33.3	0.0	45.5	0.0	45.0	35.5	0.0	36.5
Incr Delay (d2), s/veh	32.8	2.3	2.2	25.0	23.6	0.0	9.7	0.0	5.0	1.5	0.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	10.3	10.8	1.4	20.9	0.0	1.7	0.0	1.0	7.4	0.0	8.4
LnGrp Delay(d),s/veh	74.9	21.3	21.2	74.3	56.9	0.0	55.2	0.0	49.9	37.0	0.0	42.9
LnGrp LOS	E	C	C	E	E		E		D	D		D
Approach Vol, veh/h		1269			1255			82			859	
Approach Delay, s/veh		32.7			57.5			53.2			39.0	
Approach LOS		C			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	7.3	53.7		28.9	21.0	40.0
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	6.7	44.8		32.0	16.5	35.0
Max Q Clear Time (g_c+I1), s		4.8	4.2	22.0		19.3	17.0	36.5
Green Ext Time (p_c), s		0.0	0.0	21.9		4.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	978	529	577	1464	0	0	0	0	46	3	324
Future Volume (veh/h)	0	978	529	577	1464	0	0	0	0	46	3	324
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1863	1863	1827	0				1900	1863	1900
Adj Flow Rate, veh/h	0	1029	557	607	1541	0				48	3	341
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	2	4	0				0	0	0
Cap, veh/h	0	1022	451	596	2353	0				416	3	362
Arrive On Green	0.00	0.29	0.29	0.34	0.68	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	3668	1578	1774	3563	0				1810	14	1572
Grp Volume(v), veh/h	0	1029	557	607	1541	0				48	0	344
Grp Sat Flow(s),veh/h/ln	0	1787	1578	1774	1736	0				1810	0	1586
Q Serve(g_s), s	0.0	28.6	28.6	33.6	25.7	0.0				2.1	0.0	21.3
Cycle Q Clear(g_c), s	0.0	28.6	28.6	33.6	25.7	0.0				2.1	0.0	21.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1022	451	596	2353	0				416	0	365
V/C Ratio(X)	0.00	1.01	1.23	1.02	0.65	0.00				0.12	0.00	0.94
Avail Cap(c_a), veh/h	0	1022	451	596	2353	0				416	0	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.76	0.76	0.13	0.13	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.7	35.7	33.2	9.3	0.0				30.5	0.0	37.9
Incr Delay (d2), s/veh	0.0	26.1	119.3	18.3	0.2	0.0				0.0	0.0	32.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.8	27.4	19.4	12.3	0.0				1.1	0.0	12.6
LnGrp Delay(d),s/veh	0.0	61.8	155.0	51.5	9.5	0.0				30.5	0.0	70.2
LnGrp LOS		F	F	F	A					C		E
Approach Vol, veh/h		1586			2148						392	
Approach Delay, s/veh		94.6			21.4						65.4	
Approach LOS		F			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	39.2	33.7		27.1		72.9		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	33.6	28.6		23.0		67.8		
Max Q Clear Time (g_c+I1), s	35.6	30.6		23.3		27.7		
Green Ext Time (p_c), s	0.0	0.0		0.0		24.5		

Intersection Summary	
HCM 2010 Ctrl Delay	53.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	805	0	0	1437	101	604	4	580	0	0	0
Future Volume (veh/h)	219	805	0	0	1437	101	604	4	580	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1900	1810	1837	1863			
Adj Flow Rate, veh/h	238	875	0	0	1562	110	855	0	421			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	1	0	0	1	1	5	0	2			
Cap, veh/h	250	2329	0	0	1632	114	951	0	437			
Arrive On Green	0.14	0.65	0.00	0.00	0.48	0.48	0.28	0.00	0.28			
Sat Flow, veh/h	1774	3668	0	0	3483	237	3447	0	1583			
Grp Volume(v), veh/h	238	875	0	0	819	853	855	0	421			
Grp Sat Flow(s),veh/h/ln	1774	1787	0	0	1787	1839	1723	0	1583			
Q Serve(g_s), s	16.0	13.6	0.0	0.0	52.6	53.8	28.7	0.0	31.5			
Cycle Q Clear(g_c), s	16.0	13.6	0.0	0.0	52.6	53.8	28.7	0.0	31.5			
Prop In Lane	1.00		0.00	0.00		0.13	1.00		1.00			
Lane Grp Cap(c), veh/h	250	2329	0	0	861	886	951	0	437			
V/C Ratio(X)	0.95	0.38	0.00	0.00	0.95	0.96	0.90	0.00	0.96			
Avail Cap(c_a), veh/h	250	2329	0	0	861	886	951	0	437			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.17	0.17	0.00	0.00	0.72	0.72	1.00	0.00	1.00			
Uniform Delay (d), s/veh	51.2	9.6	0.0	0.0	29.8	30.1	41.8	0.0	42.9			
Incr Delay (d2), s/veh	13.5	0.1	0.0	0.0	16.8	18.2	11.6	0.0	33.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.7	6.7	0.0	0.0	29.7	31.7	15.2	0.0	17.9			
LnGrp Delay(d),s/veh	64.7	9.7	0.0	0.0	46.5	48.2	53.4	0.0	76.8			
LnGrp LOS	E	A			D	D	D		E			
Approach Vol, veh/h		1113			1672			1276				
Approach Delay, s/veh		21.5			47.4			61.1				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		82.8			20.4	62.4		37.2
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		78.2			16.9	57.8		33.1
Max Q Clear Time (g_c+I1), s		15.6			18.0	55.8		33.5
Green Ext Time (p_c), s		23.9			0.0	1.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	1257	116	20	1452	0	86	0	19	0	0	0
Future Volume (veh/h)	52	1257	116	20	1452	0	86	0	19	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1861	1900	1900	1863	0	1827	0	1810			
Adj Flow Rate, veh/h	57	1381	127	22	1596	0	95	0	21			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	0	4	0	5			
Cap, veh/h	111	2217	203	37	2256	0	135	0	119			
Arrive On Green	0.06	0.68	0.68	0.02	0.64	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3269	299	1810	3632	0	1740	0	1538			
Grp Volume(v), veh/h	57	744	764	22	1596	0	95	0	21			
Grp Sat Flow(s),veh/h/ln	1810	1768	1800	1810	1770	0	1740	0	1538			
Q Serve(g_s), s	1.8	14.1	14.3	0.7	18.0	0.0	3.2	0.0	0.8			
Cycle Q Clear(g_c), s	1.8	14.1	14.3	0.7	18.0	0.0	3.2	0.0	0.8			
Prop In Lane	1.00		0.17	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	111	1199	1221	37	2256	0	135	0	119			
V/C Ratio(X)	0.51	0.62	0.63	0.59	0.71	0.00	0.70	0.00	0.18			
Avail Cap(c_a), veh/h	180	1199	1221	165	2317	0	606	0	535			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.5	5.4	5.4	29.3	7.2	0.0	27.2	0.0	26.0			
Incr Delay (d2), s/veh	3.7	1.7	1.7	14.3	1.4	0.0	6.6	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.0	7.2	7.6	0.5	9.1	0.0	1.8	0.0	0.3			
LnGrp Delay(d),s/veh	31.1	7.1	7.1	43.6	8.6	0.0	33.7	0.0	26.7			
LnGrp LOS	C	A	A	D	A		C		C			
Approach Vol, veh/h		1565			1618			116				
Approach Delay, s/veh		8.0			9.1			32.4				
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	5.2	45.9			7.7	43.5		9.2
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.5	40.0			6.0	39.5		21.0
Max Q Clear Time (g_c+I1), s	2.7	16.3			3.8	20.0		5.2
Green Ext Time (p_c), s	0.0	23.5			0.0	18.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1764	1609	2
Future Vol, veh/h	0	20	5	1764	1609	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1819	1659	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	830	1661	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	307	393	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	307	393	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	393	-	307	-	-
HCM Lane V/C Ratio	0.013	-	0.067	-	-
HCM Control Delay (s)	14.3	-	17.6	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	98	102	139	414	312	104
Future Vol, veh/h	98	102	139	414	312	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	111	151	450	339	113

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	923	226	452	0	-	0
Stage 1	396	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	269	777	1105	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	232	777	1105	-	-	-
Mov Cap-2 Maneuver	232	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	481	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.5	2.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1105	-	232	777	-	-
HCM Lane V/C Ratio	0.137	-	0.459	0.143	-	-
HCM Control Delay (s)	8.8	-	33	10.4	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.5	-	2.2	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	934	139	18	933	39	122	3	23	68	10	349
Future Volume (veh/h)	179	934	139	18	933	39	122	3	23	68	10	349
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	195	1015	151	20	1014	42	133	3	25	0	0	466
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	238	1372	204	83	1286	53	184	18	149	0	270	459
Arrive On Green	0.13	0.44	0.44	0.05	0.37	0.37	0.10	0.10	0.10	0.00	0.00	0.14
Sat Flow, veh/h	1774	3092	460	1774	3464	143	1774	172	1437	0	1863	3167
Grp Volume(v), veh/h	195	581	585	20	518	538	133	0	28	0	0	466
Grp Sat Flow(s),veh/h/ln	1774	1770	1782	1774	1770	1837	1774	0	1609	0	1863	1583
Q Serve(g_s), s	7.4	18.8	18.8	0.8	18.0	18.0	5.0	0.0	1.1	0.0	0.0	10.0
Cycle Q Clear(g_c), s	7.4	18.8	18.8	0.8	18.0	18.0	5.0	0.0	1.1	0.0	0.0	10.0
Prop In Lane	1.00		0.26	1.00		0.08	1.00		0.89	0.00		1.00
Lane Grp Cap(c), veh/h	238	785	790	83	657	682	184	0	167	0	270	459
V/C Ratio(X)	0.82	0.74	0.74	0.24	0.79	0.79	0.72	0.00	0.17	0.00	0.00	1.02
Avail Cap(c_a), veh/h	283	846	852	128	692	719	771	0	699	0	270	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	29.1	15.9	15.9	31.7	19.3	19.3	30.0	0.0	28.2	0.0	0.0	29.5
Incr Delay (d2), s/veh	15.0	5.4	5.4	1.5	8.4	8.1	5.3	0.0	0.5	0.0	0.0	46.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	10.2	10.3	0.4	10.3	10.6	2.7	0.0	0.5	0.0	0.0	7.3
LnGrp Delay(d),s/veh	44.1	21.3	21.3	33.2	27.7	27.4	35.3	0.0	28.7	0.0	0.0	75.7
LnGrp LOS	D	C	C	C	C	C	D		C			F
Approach Vol, veh/h		1361			1076			161			466	
Approach Delay, s/veh		24.6			27.6			34.1			75.7	
Approach LOS		C			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.2	35.6		11.2	13.2	30.6		14.0
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 33		30.0	11.0	27.0		10.0
Max Q Clear Time (g_c+I1), s	2.8	20.8		7.0	9.4	20.0		12.0
Green Ext Time (p_c), s	1.9	9.8		0.5	0.1	5.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	33.9
HCM 2010 LOS	C

Notes

Intersection	
Intersection Delay, s/veh	79.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	291	374	128	251	0	582	0	167	0	0	0
Future Vol, veh/h	1	291	374	128	251	0	582	0	167	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	7	3	7	6	0	5	0	4	0	0	0
Mvmt Flow	1	303	390	133	261	0	606	0	174	0	0	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	26.7	20.2	156.3	0
HCM LOS	D	C	F	-

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	582	167	292	374	128	251	0
LT Vol	582	0	1	0	128	0	0
Through Vol	0	0	291	0	0	251	0
RT Vol	0	167	0	374	0	0	0
Lane Flow Rate	606	174	304	390	133	261	0
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	1.356	0.326	0.627	0.74	0.311	0.572	0
Departure Headway (Hd)	8.054	6.742	8.228	7.623	9.228	8.689	9.907
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	455	534	441	479	392	418	0
Service Time	5.798	4.485	5.928	5.323	6.928	6.389	7.907
HCM Lane V/C Ratio	1.332	0.326	0.689	0.814	0.339	0.624	0
HCM Control Delay	197.5	12.7	23.8	29	16	22.4	12.9
HCM Lane LOS	F	B	C	D	C	C	N
HCM 95th-tile Q	27.9	1.4	4.2	6.1	1.3	3.5	0

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	81	1107	16	106	654
Future Vol, veh/h	14	81	1107	16	106	654
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	2	0	2	5
Mvmt Flow	15	87	1190	17	114	703

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2130	1199	0	0	1208	0
Stage 1	1199	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	55	228	-	-	578	-
Stage 1	288	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	44	228	-	-	578	-
Mov Cap-2 Maneuver	44	-	-	-	-	-
Stage 1	288	-	-	-	-	-
Stage 2	311	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	78.8	0	1.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	141	578	-
HCM Lane V/C Ratio	-	-	0.724	0.197	-
HCM Control Delay (s)	-	-	78.8	12.8	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	4.2	0.7	-

Intersection	
Int Delay, s/veh	10

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	3	52	1	5	9	1114	86	2	668	1
Future Vol, veh/h	2	2	3	52	1	5	9	1114	86	2	668	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	1	0	5	0
Mvmt Flow	2	2	3	57	1	5	10	1211	93	2	726	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1962	1961	727	1962	1962	1211	727	0	0	1211	0	0
Stage 1	731	731	-	1230	1230	-	-	-	-	-	-	-
Stage 2	1231	1230	-	732	732	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	48	64	427	~ 48	64	224	886	-	-	583	-	-
Stage 1	416	430	-	219	252	-	-	-	-	-	-	-
Stage 2	219	252	-	416	430	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	46	63	427	~ 46	63	224	886	-	-	583	-	-
Mov Cap-2 Maneuver	46	63	-	~ 46	63	-	-	-	-	-	-	-
Stage 1	411	429	-	217	249	-	-	-	-	-	-	-
Stage 2	210	249	-	409	429	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	50.9	$ 328.6	0.1	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	886	-	-	53	427	46	224	583	-	-
HCM Lane V/C Ratio	0.011	-	-	0.082	0.008	1.252	0.024	0.004	-	-
HCM Control Delay (s)	9.1	-	-	78.9	13.5	$ 357.6	21.5	11.2	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	5.4	0.1	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	16
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	28	97	59	21	11	107	244	88	7	166	79
Future Vol, veh/h	87	28	97	59	21	11	107	244	88	7	166	79
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	5	0	5	0	5	0	4	2	1	0	5	4
Mvmt Flow	98	31	109	66	24	12	120	274	99	8	187	89
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	12.6	13.2	19.8	13.1
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	76%	0%	65%	100%	0%	0%
Vol Thru, %	0%	73%	24%	0%	23%	0%	100%	0%
Vol Right, %	0%	27%	0%	100%	12%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	107	332	115	97	91	7	166	79
LT Vol	107	0	87	0	59	7	0	0
Through Vol	0	244	28	0	21	0	166	0
RT Vol	0	88	0	97	11	0	0	79
Lane Flow Rate	120	373	129	109	102	8	187	89
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.244	0.68	0.284	0.204	0.229	0.017	0.378	0.162
Departure Headway (Hd)	7.294	6.56	7.903	6.722	8.058	7.714	7.29	6.558
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	493	552	455	534	446	464	494	547
Service Time	5.031	4.297	5.647	4.465	5.809	5.458	5.034	4.302
HCM Lane V/C Ratio	0.243	0.676	0.284	0.204	0.229	0.017	0.379	0.163
HCM Control Delay	12.4	22.2	13.8	11.2	13.2	10.6	14.4	10.6
HCM Lane LOS	B	C	B	B	B	B	B	B
HCM 95th-tile Q	0.9	5.2	1.2	0.8	0.9	0.1	1.7	0.6

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	28	458	329	1
Future Vol, veh/h	0	11	28	458	329	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	2	3	0
Mvmt Flow	0	13	33	533	383	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	981	383	384	0	-	0
Stage 1	383	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	279	669	1164	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	271	669	1164	-	-	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1164	-	669	-	-
HCM Lane V/C Ratio	0.028	-	0.019	-	-
HCM Control Delay (s)	8.2	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	8.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	74	193	293	57	133	207
Future Vol, veh/h	74	193	293	57	133	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	10	2	1	7	5	1
Mvmt Flow	84	219	333	65	151	235

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	903	365	0	0	398	0
Stage 1	365	-	-	-	-	-
Stage 2	538	-	-	-	-	-
Critical Hdwy	6.5	6.22	-	-	4.15	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	-	-	2.245	-
Pot Cap-1 Maneuver	298	680	-	-	1144	-
Stage 1	685	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	259	680	-	-	1144	-
Mov Cap-2 Maneuver	259	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	495	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.7	0	3.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	469	1144	-
HCM Lane V/C Ratio	-	-	0.647	0.132	-
HCM Control Delay (s)	-	-	25.7	8.6	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	4.5	0.5	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	9	359	7	5	279
Future Vol, veh/h	40	9	359	7	5	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	43	10	382	7	5	297

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	693	386	0	0	389	0
Stage 1	386	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	412	666	-	-	1181	-
Stage 1	691	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	410	666	-	-	1181	-
Mov Cap-2 Maneuver	410	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	410	666	1181	-
HCM Lane V/C Ratio	-	-	0.104	0.014	0.005	-
HCM Control Delay (s)	-	-	14.8	10.5	8.1	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	8	0	358	44	8	311	0
Future Vol, veh/h	0	0	0	38	0	8	0	358	44	8	311	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	3	0	0	0	2	0	0	3	0
Mvmt Flow	0	0	0	42	0	9	0	393	48	9	342	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	781	801	342	777	777	418	342	0	0	442	0	0
Stage 1	359	359	-	418	418	-	-	-	-	-	-	-
Stage 2	422	442	-	359	359	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	315	320	705	313	330	639	1228	-	-	1129	-	-
Stage 1	663	631	-	610	594	-	-	-	-	-	-	-
Stage 2	613	580	-	657	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	309	317	705	311	327	639	1228	-	-	1129	-	-
Mov Cap-2 Maneuver	309	317	-	311	327	-	-	-	-	-	-	-
Stage 1	663	626	-	610	594	-	-	-	-	-	-	-
Stage 2	605	580	-	652	626	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	17.4	0	0.2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1228	-	-	-	341	1129	-	-
HCM Lane V/C Ratio	-	-	-	-	0.148	0.008	-	-
HCM Control Delay (s)	0	-	-	0	17.4	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	42	360	160	38	311
Future Vol, veh/h	159	42	360	160	38	311
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	181	48	409	182	43	353

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	940	500	0	0	591	0
Stage 1	500	-	-	-	-	-
Stage 2	440	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	295	575	-	-	995	-
Stage 1	613	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	282	575	-	-	995	-
Mov Cap-2 Maneuver	411	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	411	575	995	-
HCM Lane V/C Ratio	-	-	0.44	0.083	0.043	-
HCM Control Delay (s)	-	-	20.5	11.8	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	37	31	490	451	3
Future Vol, veh/h	3	37	31	490	451	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	3	4	2	3	0
Mvmt Flow	3	42	35	551	507	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1128	508	510	0	-	0
Stage 1	508	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	228	563	1045	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	220	563	1045	-	-	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	522	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1045	-	539	-	-
HCM Lane V/C Ratio	0.033	-	0.083	-	-
HCM Control Delay (s)	8.6	-	12.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	145	1	1	15	224	896	5	3	916	12
Future Vol, veh/h	0	0	145	1	1	15	224	896	5	3	916	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	7	4	3	0	33	1	0
Mvmt Flow	0	0	153	1	1	16	236	943	5	3	964	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	964	2388	2388	946	964	0	0	948	0	0
Stage 1	-	-	-	1417	1417	-	-	-	-	-	-	-
Stage 2	-	-	-	971	971	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.21	7.1	6.5	6.27	4.14	-	-	4.43	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.309	3.5	4	3.363	2.236	-	-	2.497	-	-
Pot Cap-1 Maneuver	0	0	311	24	34	310	706	-	-	613	-	-
Stage 1	0	0	-	172	205	-	-	-	-	-	-	-
Stage 2	0	0	-	307	334	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	311	9	23	310	706	-	-	613	-	-
Mov Cap-2 Maneuver	-	-	-	9	23	-	-	-	-	-	-	-
Stage 1	-	-	-	115	136	-	-	-	-	-	-	-
Stage 2	-	-	-	156	332	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.2	59.1	2.5	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	706	-	-	311	84	613	-	-
HCM Lane V/C Ratio	0.334	-	-	0.491	0.213	0.005	-	-
HCM Control Delay (s)	12.6	-	-	27.2	59.1	10.9	-	-
HCM Lane LOS	B	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	1.5	-	-	2.6	0.7	0	-	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	49	276	197	71	22	269	318	159	22	337	41
Future Volume (veh/h)	55	49	276	197	71	22	269	318	159	22	337	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1667	1827	1881	1810	1900	1863	1863	1845	1900	1855	1900
Adj Flow Rate, veh/h	68	60	341	243	88	27	332	393	196	27	416	51
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	14	4	1	5	5	2	2	3	0	2	2
Cap, veh/h	425	423	385	314	232	71	317	654	542	33	580	71
Arrive On Green	0.25	0.25	0.25	0.18	0.18	0.18	0.18	0.35	0.35	0.02	0.18	0.18
Sat Flow, veh/h	1675	1667	1519	1792	1325	406	1774	1863	1543	1810	3143	382
Grp Volume(v), veh/h	68	60	341	243	0	115	332	393	196	27	232	235
Grp Sat Flow(s),veh/h/ln	1675	1667	1519	1792	0	1731	1774	1863	1543	1810	1762	1763
Q Serve(g_s), s	2.7	2.4	18.7	11.2	0.0	5.1	15.5	15.1	8.2	1.3	10.7	10.9
Cycle Q Clear(g_c), s	2.7	2.4	18.7	11.2	0.0	5.1	15.5	15.1	8.2	1.3	10.7	10.9
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	425	423	385	314	0	304	317	654	542	33	325	326
V/C Ratio(X)	0.16	0.14	0.88	0.77	0.00	0.38	1.05	0.60	0.36	0.82	0.71	0.72
Avail Cap(c_a), veh/h	541	538	490	578	0	559	317	719	596	63	416	417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	25.1	31.1	34.1	0.0	31.6	35.6	23.2	20.9	42.5	33.2	33.3
Incr Delay (d2), s/veh	0.1	0.1	12.7	1.5	0.0	0.3	63.5	0.7	0.2	16.8	2.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.1	9.2	5.7	0.0	2.5	13.1	7.9	3.5	0.8	5.4	5.5
LnGrp Delay(d),s/veh	25.2	25.1	43.8	35.7	0.0	31.9	99.2	23.8	21.1	59.3	35.7	36.1
LnGrp LOS	C	C	D	D		C	F	C	C	E	D	D
Approach Vol, veh/h		469			358			921			494	
Approach Delay, s/veh		38.7			34.5			50.4			37.2	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	36.0		26.0	20.0	21.5		19.2
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	3.0	33.5		28.0	15.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	3.3	17.1		20.7	17.5	12.9		13.2
Green Ext Time (p_c), s	0.0	3.6		0.7	0.0	2.6		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	42.5
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	14	9	78	24	260	15	559	86	313	658	8
Future Volume (veh/h)	9	14	9	78	24	260	15	559	86	313	658	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1845	1900	1881	1845	1863	1845	1900
Adj Flow Rate, veh/h	10	16	10	89	27	295	17	635	98	356	748	9
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	3	0	1	3	2	3	3
Cap, veh/h	117	166	83	296	78	645	22	773	638	404	1140	14
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.41	0.41	0.23	0.63	0.63
Sat Flow, veh/h	267	898	448	1099	425	1559	1810	1881	1553	1774	1819	22
Grp Volume(v), veh/h	36	0	0	116	0	295	17	635	98	356	0	757
Grp Sat Flow(s),veh/h/ln	1612	0	0	1524	0	1559	1810	1881	1553	1774	0	1841
Q Serve(g_s), s	0.0	0.0	0.0	3.2	0.0	9.3	0.6	20.4	2.7	13.2	0.0	17.7
Cycle Q Clear(g_c), s	1.1	0.0	0.0	4.4	0.0	9.3	0.6	20.4	2.7	13.2	0.0	17.7
Prop In Lane	0.28		0.28	0.77		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	365	0	0	375	0	645	22	773	638	404	0	1154
V/C Ratio(X)	0.10	0.00	0.00	0.31	0.00	0.46	0.78	0.82	0.15	0.88	0.00	0.66
Avail Cap(c_a), veh/h	497	0	0	506	0	782	146	844	697	496	0	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	0.0	24.3	0.0	14.5	33.5	17.8	12.6	25.3	0.0	8.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	19.1	6.1	0.1	13.7	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	1.9	0.0	4.1	0.4	11.9	1.2	8.0	0.0	9.2
LnGrp Delay(d),s/veh	23.2	0.0	0.0	24.7	0.0	15.0	52.6	23.9	12.7	39.1	0.0	9.3
LnGrp LOS	C			C		B	D	C	B	D		A
Approach Vol, veh/h		36			411			750			1113	
Approach Delay, s/veh		23.2			17.7			23.1			18.8	
Approach LOS		C			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.5	31.9		16.5	4.8	46.6		16.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	19.0	30.5		18.5	5.5	44.0		18.5
Max Q Clear Time (g_c+I1), s	15.2	22.4		3.1	2.6	19.7		11.3
Green Ext Time (p_c), s	0.3	5.5		1.7	0.0	11.6		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Future Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1843	1810	1845	1859	1900	1881	1870	1900	1845	1827	1881
Adj Flow Rate, veh/h	60	52	65	72	58	48	154	364	94	34	151	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	5	3	4	4	1	2	2	3	4	1
Cap, veh/h	132	114	211	242	130	107	201	819	209	70	402	352
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.29	0.29	0.04	0.22	0.00
Sat Flow, veh/h	962	834	1538	1757	942	780	1792	2805	716	1757	1827	1599
Grp Volume(v), veh/h	112	0	65	72	0	106	154	229	229	34	151	0
Grp Sat Flow(s),veh/h/ln	1795	0	1538	1757	0	1722	1792	1777	1744	1757	1827	1599
Q Serve(g_s), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Cycle Q Clear(g_c), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Prop In Lane	0.54		1.00	1.00		0.45	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	211	242	0	237	201	519	509	70	402	352
V/C Ratio(X)	0.45	0.00	0.31	0.30	0.00	0.45	0.77	0.44	0.45	0.48	0.38	0.00
Avail Cap(c_a), veh/h	1258	0	1078	888	0	871	960	1724	1692	314	1120	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	14.1	14.1	0.0	14.4	15.7	10.5	10.5	17.1	12.1	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.3	0.3	0.0	0.5	2.3	0.3	0.3	1.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.6	0.7	0.0	1.0	1.6	1.9	1.9	0.4	1.3	0.0
LnGrp Delay(d),s/veh	14.9	0.0	14.4	14.4	0.0	14.9	18.0	10.8	10.8	19.0	12.4	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		177			178			612			185	
Approach Delay, s/veh		14.7			14.7			12.6			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	14.3		8.5	7.1	11.7		9.1
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	35.3		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	2.7	5.9		4.1	5.0	4.6		4.1
Green Ext Time (p_c), s	0.0	2.7		0.4	0.1	2.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	13.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	304	241	59	80	176
Future Vol, veh/h	130	304	241	59	80	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	1	2	2	4	5
Mvmt Flow	143	334	265	65	88	193

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	634	265	0	0	265	0
Stage 1	265	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.43	6.21	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	-	-	2.236	-
Pot Cap-1 Maneuver	442	776	-	-	1287	-
Stage 1	777	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	408	776	-	-	1287	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	777	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.7	0	2.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	611	1287	-
HCM Lane V/C Ratio	-	-	0.781	0.068	-
HCM Control Delay (s)	-	-	28.7	8	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	7.4	0.2	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	112	130	93	123	116	135
Future Vol, veh/h	112	130	93	123	116	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	2	7	5	3
Mvmt Flow	130	151	108	143	135	157

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	281	0	565	206
Stage 1	-	-	-	-	206	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.12	-	6.45	6.23
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.327
Pot Cap-1 Maneuver	-	-	1282	-	481	832
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1282	-	437	832
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	587	-	-	1282	-
HCM Lane V/C Ratio	0.497	-	-	0.084	-
HCM Control Delay (s)	17	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.8	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	215	136	506	192	24	141	769	474	29	762	123
Future Volume (veh/h)	139	215	136	506	192	24	141	769	474	29	762	123
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	148	229	145	538	204	26	150	818	504	31	811	131
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	184	367	306	598	489	418	174	1240	838	45	992	603
Arrive On Green	0.10	0.19	0.19	0.17	0.26	0.26	0.10	0.36	0.36	0.02	0.28	0.28
Sat Flow, veh/h	1757	1881	1568	3476	1863	1594	1707	3471	1583	1810	3539	1568
Grp Volume(v), veh/h	148	229	145	538	204	26	150	818	504	31	811	131
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1594	1707	1736	1583	1810	1770	1568
Q Serve(g_s), s	6.6	8.9	6.5	12.1	7.2	1.0	6.9	15.8	17.5	1.4	17.0	4.5
Cycle Q Clear(g_c), s	6.6	8.9	6.5	12.1	7.2	1.0	6.9	15.8	17.5	1.4	17.0	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	367	306	598	489	418	174	1240	838	45	992	603
V/C Ratio(X)	0.81	0.62	0.47	0.90	0.42	0.06	0.86	0.66	0.60	0.69	0.82	0.22
Avail Cap(c_a), veh/h	245	567	472	598	622	532	174	1240	838	114	1075	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	29.4	28.4	32.3	24.3	22.0	35.2	21.5	13.0	38.5	26.8	16.4
Incr Delay (d2), s/veh	13.5	3.7	2.4	16.7	1.2	0.1	33.6	1.8	1.8	16.9	5.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.0	3.0	7.1	3.8	0.4	4.9	7.8	8.1	0.9	9.1	2.0
LnGrp Delay(d),s/veh	48.4	33.1	30.9	49.0	25.5	22.2	68.8	23.3	14.8	55.5	32.3	16.8
LnGrp LOS	D	C	C	D	C	C	E	C	B	E	C	B
Approach Vol, veh/h		522			768			1472			973	
Approach Delay, s/veh		36.8			41.9			25.0			31.0	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	34.0	18.2	21.0	12.6	27.8	12.8	26.4
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	27.3	13.7	24.0	8.1	24.2	11.1	26.6
Max Q Clear Time (g_c+I1), s	3.4	19.5	14.1	10.9	8.9	19.0	8.6	9.2
Green Ext Time (p_c), s	0.0	7.4	0.0	4.6	0.0	3.3	0.1	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	215	0	66	0	1307	182	86	1317	0
Future Volume (vph)	0	0	69	215	0	66	0	1307	182	86	1317	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.95	
Frpb, ped/bikes			0.99	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.98		1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1603	1800		1455		3449		1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1603	1800		1455		3449		1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	224	0	69	0	1361	190	90	1372	0
RTOR Reduction (vph)	0	0	57	0	0	55	0	16	0	0	0	0
Lane Group Flow (vph)	0	0	15	224	0	14	0	1535	0	90	1372	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	Perm
Protected Phases								6		5	2	
Permitted Phases			4	8		8						2
Actuated Green, G (s)			13.0	13.0		13.0		33.7		4.0	41.7	
Effective Green, g (s)			13.0	13.0		13.0		33.7		4.0	41.7	
Actuated g/C Ratio			0.20	0.20		0.20		0.52		0.06	0.65	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			324	364		294		1810		109	2298	
v/s Ratio Prot								c0.45		c0.05	0.39	
v/s Ratio Perm			0.01	c0.12		0.01						
v/c Ratio			0.04	0.62		0.05		0.85		0.83	0.60	
Uniform Delay, d1			20.6	23.3		20.6		13.1		29.8	6.4	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			0.1	3.5		0.1		4.1		36.2	0.5	
Delay (s)			20.7	26.8		20.7		17.1		65.9	6.9	
Level of Service			C	C		C		B		E	A	
Approach Delay (s)		20.7			25.4			17.1			10.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	23	298	118	24	23	301	1284	98	64	1411	126
Future Volume (veh/h)	141	23	298	118	24	23	301	1284	98	64	1411	126
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1863	1881	1845	1863	1881
Adj Flow Rate, veh/h	147	24	310	123	25	24	314	1338	102	67	1470	131
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	1	3	2	1
Cap, veh/h	171	247	377	147	212	195	339	2115	955	86	1599	713
Arrive On Green	0.10	0.14	0.14	0.08	0.12	0.12	0.19	0.60	0.60	0.05	0.45	0.45
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	3539	1598	1757	3539	1577
Grp Volume(v), veh/h	147	24	310	123	25	24	314	1338	102	67	1470	131
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1770	1598	1757	1770	1577
Q Serve(g_s), s	10.5	1.5	13.7	8.7	1.6	1.7	22.4	30.9	3.5	4.8	49.2	6.3
Cycle Q Clear(g_c), s	10.5	1.5	13.7	8.7	1.6	1.7	22.4	30.9	3.5	4.8	49.2	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	171	247	377	147	212	195	339	2115	955	86	1599	713
V/C Ratio(X)	0.86	0.10	0.82	0.84	0.12	0.12	0.93	0.63	0.11	0.78	0.92	0.18
Avail Cap(c_a), veh/h	175	453	690	159	418	383	358	2115	955	170	1661	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.1	47.9	53.2	57.0	49.6	49.6	50.0	16.4	10.9	59.4	32.5	20.7
Incr Delay (d2), s/veh	31.7	0.2	4.5	28.9	0.2	0.3	29.1	0.9	0.1	14.2	9.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.7	5.5	5.4	0.8	0.8	13.5	15.3	1.6	2.6	25.9	2.8
LnGrp Delay(d),s/veh	87.8	48.0	57.7	85.9	49.8	49.9	79.1	17.3	11.0	73.6	41.4	21.0
LnGrp LOS	F	D	E	F	D	D	E	B	B	E	D	C
Approach Vol, veh/h		481			172			1754			1668	
Approach Delay, s/veh		66.4			75.7			28.0			41.1	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	80.5	14.6	21.1	28.6	62.1	16.4	19.2
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	12.2	73.1	11.4	31.3	26.0	59.3	12.7	30.0
Max Q Clear Time (g_c+I1), s	6.8	32.9	10.7	15.7	24.4	51.2	12.5	3.7
Green Ext Time (p_c), s	0.0	39.1	0.0	1.4	0.2	5.9	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	550	603	200	273	570	1186	418	0	1585	261
Future Volume (veh/h)	245	0	550	603	200	273	570	1186	418	0	1585	261
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1858	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	255	0	573	628	265	246	594	1235	435	0	1651	272
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	178	0	0	1103	331	269	376	3118	961	0	1845	603
Arrive On Green	0.10	0.00	0.00	0.31	0.18	0.18	0.28	0.82	0.82	0.00	0.37	0.37
Sat Flow, veh/h	1810	255		3548	1858	1509	1810	5085	1568	0	5103	1615
Grp Volume(v), veh/h	255	287.9		628	265	246	594	1235	435	0	1651	272
Grp Sat Flow(s),veh/h/ln	1810	F		1774	1858	1509	1810	1695	1568	0	1647	1615
Q Serve(g_s), s	14.4			21.6	20.0	23.4	30.3	9.7	11.8	0.0	45.9	18.5
Cycle Q Clear(g_c), s	14.4			21.6	20.0	23.4	30.3	9.7	11.8	0.0	45.9	18.5
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	178			1103	331	269	376	3118	961	0	1845	603
V/C Ratio(X)	1.43			0.57	0.80	0.92	1.58	0.40	0.45	0.00	0.89	0.45
Avail Cap(c_a), veh/h	178			1419	496	403	376	3118	961	0	1845	603
HCM Platoon Ratio	1.00			1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.47	0.47
Uniform Delay (d), s/veh	65.8			42.1	57.5	58.9	52.9	6.1	6.3	0.0	43.0	34.5
Incr Delay (d2), s/veh	222.1			0.2	3.0	14.9	274.2	0.4	1.5	0.0	3.7	1.2
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.2			10.7	10.5	10.9	43.7	4.5	5.4	0.0	21.4	8.5
LnGrp Delay(d),s/veh	287.9			42.3	60.6	73.8	327.1	6.5	7.8	0.0	46.7	35.6
LnGrp LOS	F			D	E	E	F	A	A		D	D
Approach Vol, veh/h					1139			2264			1923	
Approach Delay, s/veh					53.4			90.9			45.1	
Approach LOS					D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		95.7	50.3		35.0	60.7	19.0	31.3
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		76.5	58.4		* 30	41.5	14.4	39.0
Max Q Clear Time (g_c+I1), s		13.8	23.6		32.3	47.9	16.4	25.4
Green Ext Time (p_c), s		16.9	0.5		0.0	0.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	76.5
HCM 2010 LOS	E

Notes

HCM 2010 Signalized Intersection Summary
10: Sierra College Blvd & I-80 EB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	611	362	160	238	0	539	0	1342	231	612	1125	356
Future Volume (veh/h)	611	362	160	238	0	539	0	1342	231	612	1125	356
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1827	1900	0	1900	0	1776	1900	1881	1845	1827
Adj Flow Rate, veh/h	630	373	165	245	0	556	0	1384	238	631	1160	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	4	0	0	0	0	7	0	1	3	4
Cap, veh/h	1027	441	193	258	0	0	0	1471	389	1197	2199	974
Arrive On Green	0.30	0.12	0.12	0.14	0.00	0.00	0.00	0.24	0.24	0.11	0.21	0.00
Sat Flow, veh/h	3442	3539	1553	1810	245		0	6357	1615	3476	3505	1553
Grp Volume(v), veh/h	630	373	165	245	104.2		0	1384	238	631	1160	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1553	1810	F		0	1527	1615	1738	1752	1553
Q Serve(g_s), s	22.9	15.1	15.2	19.6			0.0	32.5	13.7	25.0	43.0	0.0
Cycle Q Clear(g_c), s	22.9	15.1	15.2	19.6			0.0	32.5	13.7	25.0	43.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1027	441	193	258			0	1471	389	1197	2199	974
V/C Ratio(X)	0.61	0.85	0.85	0.95			0.00	0.94	0.61	0.53	0.53	0.00
Avail Cap(c_a), veh/h	1027	1018	447	258			0	1489	394	1197	2199	974
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.89	0.89	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.0	62.5	62.6	62.1			0.0	54.4	25.2	53.5	38.6	0.0
Incr Delay (d2), s/veh	1.0	1.8	4.1	42.1			0.0	11.9	6.2	0.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	7.5	6.7	12.8			0.0	15.0	6.8	12.1	21.2	0.0
LnGrp Delay(d),s/veh	44.9	64.3	66.7	104.2			0.0	66.4	31.5	53.7	39.5	0.0
LnGrp LOS	D	E	E	F				E	C	D	D	
Approach Vol, veh/h		1168						1622			1791	
Approach Delay, s/veh		54.2						61.2			44.5	
Approach LOS		D						E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	56.5	41.3	25.4	22.8		97.8	48.2	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	27.6	* 36	20.8	42.0		67.8	36.3	
Max Q Clear Time (g_c+I1), s	27.0	34.5	21.6	17.2		45.0	24.9	
Green Ext Time (p_c), s	0.1	0.7	0.0	1.0		4.0	1.5	

Intersection Summary	
HCM 2010 Ctrl Delay	55.5
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	0	73	90	0	178	77	1368	177	0	1293	143
Future Volume (veh/h)	131	0	73	90	0	178	77	1368	177	0	1293	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1267	1776	1863	1867	1900	0	1863	1863
Adj Flow Rate, veh/h	142	0	79	94	0	185	84	1425	184	0	1347	155
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %	2	2	2	2	2	7	2	2	2	0	2	2
Cap, veh/h	187	0	167	177	0	222	99	3467	447	0	1741	779
Arrive On Green	0.11	0.00	0.11	0.15	0.00	0.15	0.06	0.60	0.60	0.00	0.49	0.49
Sat Flow, veh/h	1774	0	1583	1206	0	1509	1774	5803	748	0	3632	1583
Grp Volume(v), veh/h	142	0	79	94	0	185	84	1182	427	0	1347	155
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1206	0	1509	1774	1606	1734	0	1770	1583
Q Serve(g_s), s	7.0	0.0	4.2	6.5	0.0	10.7	4.2	11.8	11.8	0.0	28.1	5.0
Cycle Q Clear(g_c), s	7.0	0.0	4.2	6.5	0.0	10.7	4.2	11.8	11.8	0.0	28.1	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	0.00		1.00
Lane Grp Cap(c), veh/h	187	0	167	177	0	222	99	2878	1036	0	1741	779
V/C Ratio(X)	0.76	0.00	0.47	0.53	0.00	0.83	0.85	0.41	0.41	0.00	0.77	0.20
Avail Cap(c_a), veh/h	355	0	317	241	0	302	99	2878	1036	0	1741	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.81	0.81	0.81	0.00	0.77	0.77
Uniform Delay (d), s/veh	39.1	0.0	37.9	35.5	0.0	37.3	42.1	9.7	9.7	0.0	18.8	12.9
Incr Delay (d2), s/veh	6.2	0.0	2.1	2.4	0.0	13.5	40.5	0.4	1.0	0.0	2.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	1.9	2.3	0.0	5.3	3.2	5.2	5.9	0.0	14.3	2.2
LnGrp Delay(d),s/veh	45.3	0.0	40.0	38.0	0.0	50.9	82.7	10.0	10.6	0.0	21.4	13.3
LnGrp LOS	D		D	D		D	F	B	B		C	B
Approach Vol, veh/h		221			279			1693			1502	
Approach Delay, s/veh		43.4			46.5			13.8			20.6	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		58.3		14.0	9.5	48.8		17.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		40.5		18.0	5.0	31.0		18.0
Max Q Clear Time (g_c+I1), s		13.8		9.0	6.2	30.1		12.7
Green Ext Time (p_c), s		23.5		0.5	0.0	0.9		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	114	1	102	1	1517	126	122	1328	5
Future Volume (veh/h)	3	0	3	114	1	102	1	1517	126	122	1328	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1827	1900	1900	1900	1863	1881	1727	1863	1900
Adj Flow Rate, veh/h	3	0	3	118	1	105	1	1564	130	126	1369	5
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	4	0	0	0	2	1	10	2	0
Cap, veh/h	7	0	32	237	164	139	3	2511	789	157	2081	949
Arrive On Green	0.00	0.00	0.02	0.07	0.09	0.09	0.00	0.49	0.49	0.10	0.59	0.59
Sat Flow, veh/h	1810	0	1615	3375	1900	1615	1810	5085	1597	1645	3539	1614
Grp Volume(v), veh/h	3	0	3	118	1	105	1	1564	130	126	1369	5
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1688	1900	1615	1810	1695	1597	1645	1770	1614
Q Serve(g_s), s	0.1	0.0	0.1	2.1	0.0	3.9	0.0	13.9	2.8	4.6	16.1	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	2.1	0.0	3.9	0.0	13.9	2.8	4.6	16.1	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	7	0	32	237	164	139	3	2511	789	157	2081	949
V/C Ratio(X)	0.41	0.00	0.09	0.50	0.01	0.76	0.34	0.62	0.16	0.80	0.66	0.01
Avail Cap(c_a), veh/h	146	0	852	404	1076	915	146	2658	835	210	2081	949
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	29.7	27.7	25.8	27.6	30.8	11.4	8.6	27.4	8.6	5.3
Incr Delay (d2), s/veh	32.5	0.0	1.5	1.6	0.0	9.6	57.6	0.5	0.1	14.8	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	1.0	0.0	2.1	0.1	6.5	1.2	2.7	7.8	0.0
LnGrp Delay(d),s/veh	63.2	0.0	31.2	29.3	25.8	37.2	88.5	11.9	8.7	42.1	9.4	5.3
LnGrp LOS	E		C	C	C	D	F	B	A	D	A	A
Approach Vol, veh/h		6			224			1695			1500	
Approach Delay, s/veh		47.2			33.0			11.7			12.1	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	36.3	8.8	6.2	4.6	42.1	4.8	10.3
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	7.9	32.3	7.4	32.6	5.0	35.2	5.0	35.0
Max Q Clear Time (g_c+I1), s	6.6	15.9	4.1	2.1	2.0	18.1	2.1	5.9
Green Ext Time (p_c), s	0.0	14.6	0.1	0.4	0.0	16.3	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	20	15	1607	1418	27
Future Volume (veh/h)	37	20	15	1607	1418	27
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1900	1863	1846	1900
Adj Flow Rate, veh/h	40	22	16	1747	1541	29
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	0	2	3	3
Cap, veh/h	209	99	37	2460	2889	54
Arrive On Green	0.06	0.06	0.02	0.70	0.57	0.57
Sat Flow, veh/h	3408	1615	1810	3632	5258	96
Grp Volume(v), veh/h	40	22	16	1747	1017	553
Grp Sat Flow(s),veh/h/ln	1704	1615	1810	1770	1680	1829
Q Serve(g_s), s	0.5	0.5	0.4	12.4	7.9	7.9
Cycle Q Clear(g_c), s	0.5	0.5	0.4	12.4	7.9	7.9
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	209	99	37	2460	1906	1037
V/C Ratio(X)	0.19	0.22	0.44	0.71	0.53	0.53
Avail Cap(c_a), veh/h	1506	713	216	2645	1906	1037
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	18.7	20.3	3.8	5.6	5.6
Incr Delay (d2), s/veh	0.4	1.1	7.9	0.9	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	6.1	3.6	4.0
LnGrp Delay(d),s/veh	19.1	19.8	28.2	4.7	6.0	6.2
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	62			1763	1570	
Approach Delay, s/veh	19.4			4.9	6.1	
Approach LOS	B			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		7.1	5.3	29.5				34.8
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	5.0	21.8				31.3
Max Q Clear Time (g_c+I1), s		2.5	2.4	9.9				14.4
Green Ext Time (p_c), s		0.1	0.0	11.6				14.7

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	300	337	95	278	207	352	1151	97	189	983	243
Future Volume (veh/h)	300	300	337	95	278	207	352	1151	97	189	983	243
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1881	1863	1839	1900	1827	1856	1900	1863	1863	1827
Adj Flow Rate, veh/h	312	312	351	99	290	216	367	1199	101	197	1024	253
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	1	2	5	5	4	2	2	2	2	4
Cap, veh/h	338	1045	467	101	310	223	452	1160	98	203	1693	506
Arrive On Green	0.19	0.30	0.30	0.06	0.16	0.16	0.13	0.35	0.35	0.11	0.33	0.33
Sat Flow, veh/h	1774	3539	1583	1774	1914	1377	3375	3291	277	1774	5085	1521
Grp Volume(v), veh/h	312	312	351	99	264	242	367	641	659	197	1024	253
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1747	1544	1688	1763	1804	1774	1695	1521
Q Serve(g_s), s	18.1	7.2	21.1	5.9	15.7	16.4	11.1	37.0	37.0	11.6	17.7	14.0
Cycle Q Clear(g_c), s	18.1	7.2	21.1	5.9	15.7	16.4	11.1	37.0	37.0	11.6	17.7	14.0
Prop In Lane	1.00		1.00	1.00		0.89	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	338	1045	467	101	283	250	452	621	636	203	1693	506
V/C Ratio(X)	0.92	0.30	0.75	0.98	0.93	0.97	0.81	1.03	1.04	0.97	0.60	0.50
Avail Cap(c_a), veh/h	338	1045	467	101	283	250	547	621	636	203	1693	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	28.6	33.5	49.4	43.4	43.7	44.2	34.0	34.0	46.3	29.3	28.0
Incr Delay (d2), s/veh	30.1	0.6	9.6	81.6	36.4	48.2	10.0	44.7	45.3	54.9	0.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	3.6	10.4	5.2	10.4	10.3	5.8	25.7	26.4	8.8	8.4	6.0
LnGrp Delay(d),s/veh	71.9	29.2	43.1	131.0	79.8	91.9	54.2	78.7	79.3	101.2	30.0	29.1
LnGrp LOS	E	C	D	F	E	F	D	F	F	F	C	C
Approach Vol, veh/h		975			605			1667			1474	
Approach Delay, s/veh		47.8			93.0			73.5			39.4	
Approach LOS		D			F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	42.0	10.0	37.0	18.0	40.0	24.0	23.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	12.0	37.0	6.0	31.0	17.0	32.0	20.0	17.0
Max Q Clear Time (g_c+I1), s	13.6	39.0	7.9	23.1	13.1	19.7	20.1	18.4
Green Ext Time (p_c), s	0.0	0.0	0.0	5.8	1.0	12.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	60.1
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	23	97	46	10	42	107	391	58	40	484	81
Future Volume (veh/h)	58	23	97	46	10	42	107	391	58	40	484	81
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1771	1810	1900	1729	1900	1792	1803	1900	1597	1863	1863
Adj Flow Rate, veh/h	64	25	107	51	11	46	118	430	64	44	532	89
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	90	20	581	96	11	610	147	577	86	63	617	512
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.09	0.38	0.38	0.04	0.33	0.33
Sat Flow, veh/h	0	53	1536	0	29	1613	1707	1534	228	1521	1863	1548
Grp Volume(v), veh/h	89	0	107	62	0	46	118	0	494	44	532	89
Grp Sat Flow(s),veh/h/ln	54	0	1536	29	0	1613	1707	0	1762	1521	1863	1548
Q Serve(g_s), s	0.0	0.0	3.2	0.0	0.0	1.2	4.6	0.0	16.6	2.0	18.3	2.8
Cycle Q Clear(g_c), s	25.9	0.0	3.2	25.9	0.0	1.2	4.6	0.0	16.6	2.0	18.3	2.8
Prop In Lane	0.72		1.00	0.82		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	111	0	581	107	0	610	147	0	662	63	617	512
V/C Ratio(X)	0.80	0.00	0.18	0.58	0.00	0.08	0.80	0.00	0.75	0.70	0.86	0.17
Avail Cap(c_a), veh/h	111	0	581	107	0	610	147	0	662	120	658	547
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	14.2	29.7	0.0	13.6	30.7	0.0	18.5	32.4	21.4	16.3
Incr Delay (d2), s/veh	34.1	0.0	0.2	8.3	0.0	0.1	26.8	0.0	6.0	15.1	12.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	1.4	1.4	0.0	0.6	3.3	0.0	9.2	1.1	11.5	1.2
LnGrp Delay(d),s/veh	62.6	0.0	14.4	38.1	0.0	13.7	57.6	0.0	24.6	47.5	34.3	16.7
LnGrp LOS	E		B	D		B	E		C	D	C	B
Approach Vol, veh/h		196			108			612			665	
Approach Delay, s/veh		36.3			27.7			30.9			32.8	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	31.1		30.4	10.0	28.1		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.4	24.7		25.9	5.9	24.2		25.9
Max Q Clear Time (g_c+I1), s	4.0	18.6		27.9	6.6	20.3		27.9
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0	2.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	111	19	575	121	232	14	621	557	199	533	25
Future Volume (veh/h)	29	111	19	575	121	232	14	621	557	199	533	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1850	1881	1900	1845	1881	1827	1860	1900
Adj Flow Rate, veh/h	31	118	20	704	0	247	15	661	593	212	567	27
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	6	1	0	3	1	4	2	2
Cap, veh/h	154	263	44	895	0	397	26	1187	541	171	1451	69
Arrive On Green	0.09	0.09	0.09	0.25	0.00	0.25	0.01	0.34	0.34	0.10	0.42	0.42
Sat Flow, veh/h	1810	3092	512	3583	0	1589	1810	3505	1596	1740	3431	163
Grp Volume(v), veh/h	31	68	70	704	0	247	15	661	593	212	292	302
Grp Sat Flow(s),veh/h/ln	1810	1805	1799	1792	0	1589	1810	1752	1596	1740	1767	1827
Q Serve(g_s), s	1.3	2.9	3.0	14.9	0.0	11.2	0.7	12.5	27.5	8.0	9.3	9.3
Cycle Q Clear(g_c), s	1.3	2.9	3.0	14.9	0.0	11.2	0.7	12.5	27.5	8.0	9.3	9.3
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	154	154	153	895	0	397	26	1187	541	171	748	773
V/C Ratio(X)	0.20	0.44	0.46	0.79	0.00	0.62	0.59	0.56	1.10	1.24	0.39	0.39
Avail Cap(c_a), veh/h	624	622	620	1236	0	548	89	1187	541	171	748	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	35.3	35.4	28.4	0.0	27.1	39.8	21.9	26.9	36.6	16.2	16.2
Incr Delay (d2), s/veh	0.6	2.0	2.1	2.4	0.0	1.6	19.5	0.7	67.9	146.4	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.5	1.6	7.6	0.0	5.1	0.5	6.2	22.2	10.8	4.6	4.8
LnGrp Delay(d),s/veh	35.2	37.3	37.5	30.8	0.0	28.7	59.3	22.6	94.7	183.0	16.7	16.7
LnGrp LOS	D	D	D	C		C	E	C	F	F	B	B
Approach Vol, veh/h		169			951			1269			806	
Approach Delay, s/veh		37.0			30.2			56.7			60.4	
Approach LOS		D			C			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	32.5		11.9	5.1	39.4		24.8
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	8.0	27.5		28.0	4.0	31.5		28.0
Max Q Clear Time (g_c+I1), s	10.0	29.5		5.0	2.7	11.3		16.9
Green Ext Time (p_c), s	0.0	0.0		0.8	0.0	14.3		2.9

Intersection Summary	
HCM 2010 Ctrl Delay	48.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	733	14	22	723	504	43	15	22	450	24	256
Future Volume (veh/h)	261	733	14	22	723	504	43	15	22	450	24	256
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1846	1900	1881	1875	1863
Adj Flow Rate, veh/h	278	780	15	23	769	0	46	16	23	498	0	272
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	302	1562	30	34	1024	445	147	55	80	848	0	373
Arrive On Green	0.17	0.44	0.44	0.02	0.29	0.00	0.08	0.08	0.08	0.24	0.00	0.24
Sat Flow, veh/h	1792	3588	69	1723	3574	1553	1810	679	977	3583	0	1575
Grp Volume(v), veh/h	278	389	406	23	769	0	46	0	39	498	0	272
Grp Sat Flow(s),veh/h/ln	1792	1787	1869	1723	1787	1553	1810	0	1656	1792	0	1575
Q Serve(g_s), s	13.1	13.5	13.5	1.1	16.8	0.0	2.1	0.0	1.9	10.6	0.0	13.7
Cycle Q Clear(g_c), s	13.1	13.5	13.5	1.1	16.8	0.0	2.1	0.0	1.9	10.6	0.0	13.7
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	302	778	814	34	1024	445	147	0	135	848	0	373
V/C Ratio(X)	0.92	0.50	0.50	0.68	0.75	0.00	0.31	0.00	0.29	0.59	0.00	0.73
Avail Cap(c_a), veh/h	302	778	814	114	1122	488	147	0	135	1334	0	586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	17.5	17.5	41.9	27.9	0.0	37.2	0.0	37.2	29.1	0.0	30.3
Incr Delay (d2), s/veh	31.8	1.8	1.7	21.2	4.4	0.0	5.5	0.0	5.3	0.9	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	7.0	7.3	0.7	8.9	0.0	1.3	0.0	1.1	5.4	0.0	6.3
LnGrp Delay(d),s/veh	67.0	19.3	19.2	63.0	32.3	0.0	42.7	0.0	42.5	30.0	0.0	34.2
LnGrp LOS	E	B	B	E	C		D		D	C		C
Approach Vol, veh/h		1073			792			85			770	
Approach Delay, s/veh		31.6			33.2			42.6			31.5	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	6.2	42.4		25.4	19.0	29.6
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	5.7	35.8		32.0	14.5	27.0
Max Q Clear Time (g_c+I1), s		4.1	3.1	15.5		15.7	15.1	18.8
Green Ext Time (p_c), s		0.1	0.0	17.3		4.1	0.0	5.8

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	813	478	511	1105	0	0	0	0	33	2	192
Future Volume (veh/h)	0	813	478	511	1105	0	0	0	0	33	2	192
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1845	1863	0				1827	1863	1900
Adj Flow Rate, veh/h	0	856	503	538	1163	0				35	2	202
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	3	2	0				4	0	4
Cap, veh/h	0	1289	575	558	2634	0				267	2	241
Arrive On Green	0.00	0.36	0.36	0.32	0.74	0.00				0.15	0.15	0.15
Sat Flow, veh/h	0	3632	1579	1757	3632	0				1740	16	1570
Grp Volume(v), veh/h	0	856	503	538	1163	0				35	0	204
Grp Sat Flow(s),veh/h/ln	0	1770	1579	1757	1770	0				1740	0	1586
Q Serve(g_s), s	0.0	18.3	26.7	27.1	11.3	0.0				1.6	0.0	11.2
Cycle Q Clear(g_c), s	0.0	18.3	26.7	27.1	11.3	0.0				1.6	0.0	11.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1289	575	558	2634	0				267	0	243
V/C Ratio(X)	0.00	0.66	0.87	0.96	0.44	0.00				0.13	0.00	0.84
Avail Cap(c_a), veh/h	0	1289	575	558	2634	0				445	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	0.85	0.35	0.35	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.0	26.7	30.2	4.4	0.0				32.9	0.0	37.0
Incr Delay (d2), s/veh	0.0	2.3	14.6	14.6	0.2	0.0				0.1	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.3	13.9	15.4	5.4	0.0				0.8	0.0	5.1
LnGrp Delay(d),s/veh	0.0	26.3	41.3	44.8	4.6	0.0				33.0	0.0	40.2
LnGrp LOS		C	D	D	A					C		D
Approach Vol, veh/h		1359			1701						239	
Approach Delay, s/veh		31.8			17.3						39.1	
Approach LOS		C			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	34.2	37.9		17.9		72.1		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	28.6	23.6		23.0		57.8		
Max Q Clear Time (g_c+I1), s	29.1	28.7		13.2		13.3		
Green Ext Time (p_c), s	0.0	0.0		0.6		17.6		

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	680	0	0	1067	76	549	3	491	0	0	0
Future Volume (veh/h)	166	680	0	0	1067	76	549	3	491	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1848	1900	1845	1832	1827			
Adj Flow Rate, veh/h	184	756	0	0	1186	84	781	0	365			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	1	1	0	0	3	3	3	33	4			
Cap, veh/h	226	2136	0	0	1390	98	944	0	417			
Arrive On Green	0.13	0.60	0.00	0.00	0.42	0.42	0.27	0.00	0.27			
Sat Flow, veh/h	1792	3668	0	0	3420	235	3514	0	1553			
Grp Volume(v), veh/h	184	756	0	0	625	645	781	0	365			
Grp Sat Flow(s),veh/h/ln	1792	1787	0	0	1756	1807	1757	0	1553			
Q Serve(g_s), s	6.5	7.0	0.0	0.0	20.9	21.0	13.6	0.0	14.6			
Cycle Q Clear(g_c), s	6.5	7.0	0.0	0.0	20.9	21.0	13.6	0.0	14.6			
Prop In Lane	1.00		0.00	0.00		0.13	1.00		1.00			
Lane Grp Cap(c), veh/h	226	2136	0	0	733	755	944	0	417			
V/C Ratio(X)	0.81	0.35	0.00	0.00	0.85	0.85	0.83	0.00	0.88			
Avail Cap(c_a), veh/h	234	2136	0	0	733	755	968	0	428			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	0.84	0.84	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.7	6.7	0.0	0.0	17.1	17.1	22.4	0.0	22.7			
Incr Delay (d2), s/veh	12.5	0.3	0.0	0.0	10.4	10.2	6.2	0.0	18.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	3.5	0.0	0.0	12.2	12.5	7.3	0.0	8.3			
LnGrp Delay(d),s/veh	40.2	7.0	0.0	0.0	27.5	27.4	28.6	0.0	40.9			
LnGrp LOS	D	A			C	C	C		D			
Approach Vol, veh/h		940			1270			1146				
Approach Delay, s/veh		13.5			27.4			32.5				
Approach LOS		B			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		43.4			11.7	31.7		21.6
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		38.4			8.5	26.4		17.9
Max Q Clear Time (g_c+I1), s		9.0			8.5	23.0		16.6
Green Ext Time (p_c), s		12.2			0.0	2.6		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1004	84	12	1052	0	91	0	16	0	0	0
Future Volume (veh/h)	59	1004	84	12	1052	0	91	0	16	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1864	1900	1900	1845	0	1900	0	1900			
Adj Flow Rate, veh/h	64	1091	91	13	1143	0	99	0	17			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	0	3	0	0	0	0			
Cap, veh/h	135	1969	164	24	1876	0	143	0	128			
Arrive On Green	0.07	0.60	0.60	0.01	0.54	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3303	275	1810	3597	0	1810	0	1615			
Grp Volume(v), veh/h	64	585	597	13	1143	0	99	0	17			
Grp Sat Flow(s),veh/h/ln	1810	1771	1808	1810	1752	0	1810	0	1615			
Q Serve(g_s), s	1.5	8.6	8.6	0.3	9.8	0.0	2.3	0.0	0.4			
Cycle Q Clear(g_c), s	1.5	8.6	8.6	0.3	9.8	0.0	2.3	0.0	0.4			
Prop In Lane	1.00		0.15	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	135	1056	1078	24	1876	0	143	0	128			
V/C Ratio(X)	0.48	0.55	0.55	0.54	0.61	0.00	0.69	0.00	0.13			
Avail Cap(c_a), veh/h	250	1056	1078	230	1980	0	876	0	782			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.3	5.3	5.3	21.3	6.9	0.0	19.5	0.0	18.6			
Incr Delay (d2), s/veh	2.6	1.3	1.3	17.2	1.0	0.0	5.9	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	4.5	4.5	0.3	4.9	0.0	1.4	0.0	0.2			
LnGrp Delay(d),s/veh	21.9	6.6	6.6	38.5	7.9	0.0	25.3	0.0	19.1			
LnGrp LOS	C	A	A	D	A		C		B			
Approach Vol, veh/h		1246			1156			116				
Approach Delay, s/veh		7.4			8.3			24.4				
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.6	30.9			7.2	28.2		7.9
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.5	25.0			6.0	24.5		21.0
Max Q Clear Time (g_c+I1), s	2.3	10.6			3.5	11.8		4.3
Green Ext Time (p_c), s	0.0	13.9			0.0	11.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	1489	1601	0
Future Vol, veh/h	0	0	7	1489	1601	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	1535	1651	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	825	1651	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	320	396	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	320	396	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	396	-	-	-	-
HCM Lane V/C Ratio	0.018	-	-	-	-
HCM Control Delay (s)	14.3	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	106	130	448	363	80
Future Vol, veh/h	81	106	130	448	363	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	2	1	9
Mvmt Flow	88	115	141	487	395	87

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	964	241	482	0	-	0
Stage 1	438	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	257	766	1056	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	223	766	1056	-	-	-
Mov Cap-2 Maneuver	223	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.5	2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1056	-	223	766	-	-
HCM Lane V/C Ratio	0.134	-	0.395	0.15	-	-
HCM Control Delay (s)	8.9	-	31.3	10.5	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.5	-	1.8	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	934	96	19	980	8	109	1	15	18	3	85
Future Volume (veh/h)	33	934	96	19	980	8	109	1	15	18	3	85
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1866	1900	1900	1863	1900	1900	1783	1900	1900	1900	1900
Adj Flow Rate, veh/h	35	983	101	20	1032	8	115	1	16	19	53	56
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	69	1510	155	44	1693	13	165	8	131	40	110	129
Arrive On Green	0.04	0.47	0.47	0.02	0.47	0.47	0.09	0.09	0.09	0.08	0.08	0.08
Sat Flow, veh/h	1810	3247	334	1810	3600	28	1810	90	1439	495	1380	1615
Grp Volume(v), veh/h	35	537	547	20	507	533	115	0	17	72	0	56
Grp Sat Flow(s),veh/h/ln	1810	1773	1807	1810	1770	1858	1810	0	1529	1875	0	1615
Q Serve(g_s), s	1.0	12.3	12.3	0.6	11.3	11.3	3.3	0.0	0.5	1.9	0.0	1.8
Cycle Q Clear(g_c), s	1.0	12.3	12.3	0.6	11.3	11.3	3.3	0.0	0.5	1.9	0.0	1.8
Prop In Lane	1.00		0.18	1.00		0.02	1.00		0.94	0.26		1.00
Lane Grp Cap(c), veh/h	69	825	841	44	832	874	165	0	140	150	0	129
V/C Ratio(X)	0.51	0.65	0.65	0.46	0.61	0.61	0.70	0.00	0.12	0.48	0.00	0.43
Avail Cap(c_a), veh/h	171	936	954	171	935	981	1024	0	865	177	0	152
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.0	10.9	10.9	25.5	10.4	10.4	23.4	0.0	22.1	23.3	0.0	23.2
Incr Delay (d2), s/veh	5.7	3.3	3.2	7.4	2.7	2.6	5.2	0.0	0.4	2.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.7	6.8	0.4	6.0	6.2	1.9	0.0	0.2	1.1	0.0	0.9
LnGrp Delay(d),s/veh	30.7	14.1	14.1	32.9	13.1	13.0	28.6	0.0	22.5	25.7	0.0	25.5
LnGrp LOS	C	B	B	C	B	B	C		C	C		C
Approach Vol, veh/h		1119			1060			132			128	
Approach Delay, s/veh		14.6			13.4			27.8			25.6	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	29.7		8.8	6.0	29.9		8.2
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 28		30.0	5.0	28.0		5.0
Max Q Clear Time (g_c+I1), s	2.6	14.3		5.3	3.0	13.3		3.9
Green Ext Time (p_c), s	2.1	10.4		0.4	0.0	10.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	48
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	195	319	346	174	4	341	3	151	3	2	11
Future Vol, veh/h	6	195	319	346	174	4	341	3	151	3	2	11
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	17	6	5	2	6	0	4	0	6	0	0	0
Mvmt Flow	7	241	394	427	215	5	421	4	186	4	2	14
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	30.6	56.5	58.4	13.4
HCM LOS	D	F	F	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	99%	0%	3%	0%	100%	0%	19%
Vol Thru, %	1%	0%	97%	0%	0%	98%	12%
Vol Right, %	0%	100%	0%	100%	0%	2%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	344	151	201	319	346	178	16
LT Vol	341	0	6	0	346	0	3
Through Vol	3	0	195	0	0	174	2
RT Vol	0	151	0	319	0	4	11
Lane Flow Rate	425	186	248	394	427	220	20
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	1.013	0.377	0.577	0.813	1.008	0.49	0.053
Departure Headway (Hd)	8.753	7.451	8.555	7.62	8.685	8.222	9.859
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	416	487	424	477	423	442	365
Service Time	6.453	5.151	6.255	5.32	6.385	5.922	7.859
HCM Lane V/C Ratio	1.022	0.382	0.585	0.826	1.009	0.498	0.055
HCM Control Delay	77.6	14.6	22.3	35.8	76	18.6	13.4
HCM Lane LOS	F	B	C	E	F	C	B
HCM 95th-tile Q	12.8	1.7	3.5	7.7	12.7	2.6	0.2

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	66	718	16	44	639
Future Vol, veh/h	21	66	718	16	44	639
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	3	0	12	4
Mvmt Flow	22	69	748	17	46	666

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1513	756	0	0	765	0
Stage 1	756	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.22	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.308	-
Pot Cap-1 Maneuver	133	411	-	-	805	-
Stage 1	467	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	125	411	-	-	805	-
Mov Cap-2 Maneuver	125	-	-	-	-	-
Stage 1	467	-	-	-	-	-
Stage 2	440	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.5	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	265	805	-
HCM Lane V/C Ratio	-	-	0.342	0.057	-
HCM Control Delay (s)	-	-	25.5	9.7	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.2	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	3	69	1	2	6	734	50	6	679	2
Future Vol, veh/h	1	3	3	69	1	2	6	734	50	6	679	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	4	8	0	4	50
Mvmt Flow	1	3	3	75	1	2	7	798	54	7	738	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1563	1563	739	1565	1564	798	740	0	0	798	0	0
Stage 1	752	752	-	811	811	-	-	-	-	-	-	-
Stage 2	811	811	-	754	753	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	92	113	421	91	113	389	876	-	-	833	-	-
Stage 1	405	421	-	376	396	-	-	-	-	-	-	-
Stage 2	376	396	-	404	420	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	90	111	421	87	111	389	876	-	-	833	-	-
Mov Cap-2 Maneuver	90	111	-	87	111	-	-	-	-	-	-	-
Stage 1	402	417	-	373	393	-	-	-	-	-	-	-
Stage 2	370	393	-	394	416	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.1	145.2	0.1	0.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	876	-	-	105	421	87	389	833	-	-
HCM Lane V/C Ratio	0.007	-	-	0.041	0.008	0.875	0.006	0.008	-	-
HCM Control Delay (s)	9.1	-	-	40.8	13.6	148.9	14.3	9.4	-	-
HCM Lane LOS	A	-	-	E	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	4.7	0	0	-	-

Intersection	
Intersection Delay, s/veh	24.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	29	126	69	11	4	102	173	48	7	173	57
Future Vol, veh/h	87	29	126	69	11	4	102	173	48	7	173	57
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles, %	3	0	1	2	0	0	0	2	5	0	3	4
Mvmt Flow	143	48	207	113	18	7	167	284	79	11	284	93
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	18.5	18.6	31.9	23.9
HCM LOS	C	C	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	75%	0%	82%	100%	0%	0%
Vol Thru, %	0%	78%	25%	0%	13%	0%	100%	0%
Vol Right, %	0%	22%	0%	100%	5%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	102	221	116	126	84	7	173	57
LT Vol	102	0	87	0	69	7	0	0
Through Vol	0	173	29	0	11	0	173	0
RT Vol	0	48	0	126	4	0	0	57
Lane Flow Rate	167	362	190	207	138	11	284	93
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.408	0.819	0.48	0.455	0.378	0.029	0.681	0.206
Departure Headway (Hd)	8.777	8.137	9.09	7.932	9.883	9.111	8.647	7.941
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	410	446	397	454	364	393	417	452
Service Time	6.524	5.884	6.841	5.683	7.646	6.863	6.399	5.693
HCM Lane V/C Ratio	0.407	0.812	0.479	0.456	0.379	0.028	0.681	0.206
HCM Control Delay	17.5	38.5	20	17.2	18.6	12.1	28	12.8
HCM Lane LOS	C	E	C	C	C	B	D	B
HCM 95th-tile Q	1.9	7.7	2.5	2.3	1.7	0.1	4.9	0.8

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	23	339	338	2
Future Vol, veh/h	1	11	23	339	338	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	4	3	2	0
Mvmt Flow	1	12	26	377	376	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	805	377	378	0	-	0
Stage 1	377	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	355	674	1170	-	-	-
Stage 1	698	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	347	674	1170	-	-	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	698	-	-	-	-	-
Stage 2	647	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1170	-	625	-	-
HCM Lane V/C Ratio	0.022	-	0.021	-	-
HCM Control Delay (s)	8.1	-	10.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	74	125	237	62	124	225
Future Vol, veh/h	74	125	237	62	124	225
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	4	15	2	3
Mvmt Flow	80	136	258	67	135	245

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	805	291	0	0	325	0
Stage 1	291	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	355	753	-	-	1235	-
Stage 1	763	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	316	753	-	-	1235	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.7	0	2.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	497	1235	-
HCM Lane V/C Ratio	-	-	0.435	0.109	-
HCM Control Delay (s)	-	-	17.7	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.4	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	331	3	0	301
Future Vol, veh/h	1	1	331	3	0	301
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	2	2	690	6	0	627

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1320	693	0	0	696	0
Stage 1	693	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	175	447	-	-	909	-
Stage 1	500	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	175	447	-	-	909	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	536	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	175	447	909	-
HCM Lane V/C Ratio	-	-	0.012	0.005	-	-
HCM Control Delay (s)	-	-	25.8	13.1	0	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	29	0	13	2	321	35	13	289	0
Future Vol, veh/h	0	0	1	29	0	13	2	321	35	13	289	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	51	51	51	51	51	51	51	51	51	51	51	51
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	2	0
Mvmt Flow	0	0	2	57	0	25	4	629	69	25	567	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1302	1324	567	1291	1290	664	567	0	0	698	0	0
Stage 1	618	618	-	672	672	-	-	-	-	-	-	-
Stage 2	684	706	-	619	618	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	139	157	527	142	165	464	1015	-	-	908	-	-
Stage 1	480	484	-	449	458	-	-	-	-	-	-	-
Stage 2	442	442	-	480	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	152	527	138	160	464	1015	-	-	908	-	-
Mov Cap-2 Maneuver	128	152	-	138	160	-	-	-	-	-	-	-
Stage 1	478	471	-	447	456	-	-	-	-	-	-	-
Stage 2	416	440	-	465	471	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	42.3	0	0.4
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1015	-	-	527	176	908	-	-
HCM Lane V/C Ratio	0.004	-	-	0.004	0.468	0.028	-	-
HCM Control Delay (s)	8.6	-	-	11.9	42.3	9.1	-	-
HCM Lane LOS	A	-	-	B	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	2.2	0.1	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	17	341	69	7	312
Future Vol, veh/h	68	17	341	69	7	312
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	52	52	52	52	52	52
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	131	33	656	133	13	600

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1349	722	0	0	788	0
Stage 1	722	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	168	430	-	-	840	-
Stage 1	485	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	165	430	-	-	840	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	485	-	-	-	-	-
Stage 2	528	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.1	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	306	430	840	-
HCM Lane V/C Ratio	-	-	0.427	0.076	0.016	-
HCM Control Delay (s)	-	-	25.3	14.1	9.4	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	2	0.2	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	29	40	383	371	1
Future Vol, veh/h	0	29	40	383	371	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	55	55	55	55
Heavy Vehicles, %	0	12	10	1	1	0
Mvmt Flow	0	53	73	696	675	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1517	675	676	0	-	0
Stage 1	675	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.29	-	-	-
Pot Cap-1 Maneuver	133	437	879	-	-	-
Stage 1	510	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	122	437	879	-	-	-
Mov Cap-2 Maneuver	256	-	-	-	-	-
Stage 1	510	-	-	-	-	-
Stage 2	391	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	879	-	437	-	-
HCM Lane V/C Ratio	0.083	-	0.121	-	-
HCM Control Delay (s)	9.5	-	14.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	138.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	176	9	2	19	136	690	5	5	798	8
Future Vol, veh/h	0	0	176	9	2	19	136	690	5	5	798	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	241	12	3	26	186	945	7	7	1093	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1093	2428	2428	949	1093	0	0	952	0	0
Stage 1	-	-	-	1321	1321	-	-	-	-	-	-	-
Stage 2	-	-	-	1107	1107	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	258	19	32	312	642	-	-	730	-	-
Stage 1	0	0	-	175	228	-	-	-	-	-	-	-
Stage 2	0	0	-	233	288	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	258	~ 1	23	312	642	-	-	730	-	-
Mov Cap-2 Maneuver	-	-	-	~ 1	23	-	-	-	-	-	-	-
Stage 1	-	-	-	124	162	-	-	-	-	-	-	-
Stage 2	-	-	-	15	285	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	82.2	$ 8006.9	2.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	642	-	-	258	3	730	-	-
HCM Lane V/C Ratio	0.29	-	-	0.934	13.699	0.009	-	-
HCM Control Delay (s)	12.9	-	-	82.2	$ 8006.9	10	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	1.2	-	-	8.5	7	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Cumulative Conditions – Short Term Plus Project

Project Driveway Option A

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	127	238	143	136	125	230	397	97	40	323	114
Future Volume (veh/h)	177	127	238	143	136	125	230	397	97	40	323	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1727	1727	1827	1843	1900	1827	1863	1863	1900	1819	1900
Adj Flow Rate, veh/h	203	146	274	164	156	144	264	456	111	46	371	131
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	10	10	4	5	5	4	2	2	0	5	5
Cap, veh/h	396	389	323	372	188	174	297	627	524	59	479	166
Arrive On Green	0.23	0.23	0.23	0.21	0.21	0.21	0.17	0.34	0.34	0.03	0.19	0.19
Sat Flow, veh/h	1757	1727	1434	1740	878	811	1740	1863	1557	1810	2481	860
Grp Volume(v), veh/h	203	146	274	164	0	300	264	456	111	46	256	246
Grp Sat Flow(s),veh/h/ln	1757	1727	1434	1740	0	1689	1740	1863	1557	1810	1728	1614
Q Serve(g_s), s	9.2	6.5	16.7	7.5	0.0	15.5	13.6	19.6	4.7	2.3	12.8	13.2
Cycle Q Clear(g_c), s	9.2	6.5	16.7	7.5	0.0	15.5	13.6	19.6	4.7	2.3	12.8	13.2
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		0.53
Lane Grp Cap(c), veh/h	396	389	323	372	0	362	297	627	524	59	334	312
V/C Ratio(X)	0.51	0.38	0.85	0.44	0.00	0.83	0.89	0.73	0.21	0.78	0.77	0.79
Avail Cap(c_a), veh/h	538	529	439	533	0	518	303	683	571	59	380	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	29.9	33.9	31.1	0.0	34.3	37.1	26.6	21.7	43.9	34.9	35.1
Incr Delay (d2), s/veh	0.4	0.2	8.5	0.3	0.0	5.1	25.8	2.9	0.1	44.4	6.7	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	3.1	7.4	3.6	0.0	7.8	8.7	10.6	2.0	1.9	6.7	6.6
LnGrp Delay(d),s/veh	31.4	30.2	42.4	31.5	0.0	39.4	62.9	29.5	21.7	88.3	41.6	43.7
LnGrp LOS	C	C	D	C		D	E	C	C	F	D	D
Approach Vol, veh/h		623			464			831			548	
Approach Delay, s/veh		35.9			36.6			39.1			46.5	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	36.2		24.6	20.1	23.1		23.6
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	3.0	33.5		28.0	15.9	20.1		28.0
Max Q Clear Time (g_c+I1), s	4.3	21.6		18.7	15.6	15.2		17.5
Green Ext Time (p_c), s	0.0	3.5		1.1	0.0	2.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	45	11	50	7	490	2	414	55	428	392	1
Future Volume (veh/h)	6	45	11	50	7	490	2	414	55	428	392	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1813	1900	1900	1900	1827	1900	1827	1827	1827	1793	1900
Adj Flow Rate, veh/h	6	48	12	54	8	527	2	445	59	460	422	1
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	4	0	4	4	4	6	6
Cap, veh/h	67	338	78	407	54	841	3	536	449	504	1039	2
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.29	0.29	0.29	0.58	0.58
Sat Flow, veh/h	53	1334	308	1244	215	1547	1810	1827	1532	1740	1788	4
Grp Volume(v), veh/h	66	0	0	62	0	527	2	445	59	460	0	423
Grp Sat Flow(s),veh/h/ln	1696	0	0	1459	0	1547	1810	1827	1532	1740	0	1792
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	17.3	0.1	16.6	2.1	18.7	0.0	9.5
Cycle Q Clear(g_c), s	2.1	0.0	0.0	1.9	0.0	17.3	0.1	16.6	2.1	18.7	0.0	9.5
Prop In Lane	0.09		0.18	0.87		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	483	0	0	461	0	841	3	536	449	504	0	1041
V/C Ratio(X)	0.14	0.00	0.00	0.13	0.00	0.63	0.68	0.83	0.13	0.91	0.00	0.41
Avail Cap(c_a), veh/h	483	0	0	461	0	841	136	612	513	595	0	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	0.0	21.1	0.0	11.6	36.5	24.1	19.0	25.1	0.0	8.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.1	0.0	1.5	69.3	8.5	0.1	16.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	1.0	0.0	7.6	0.1	9.7	0.9	11.2	0.0	4.7
LnGrp Delay(d),s/veh	21.3	0.0	0.0	21.2	0.0	13.1	105.8	32.6	19.1	41.4	0.0	8.6
LnGrp LOS	C			C		B	F	C	B	D		A
Approach Vol, veh/h		66			589			506			883	
Approach Delay, s/veh		21.3			13.9			31.4			25.7	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.2	25.4		22.5	4.1	46.5		22.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	25.0	24.5		18.5	5.5	44.0		18.5
Max Q Clear Time (g_c+I1), s	20.7	18.6		4.1	2.1	11.5		19.3
Green Ext Time (p_c), s	0.5	2.8		2.5	0.0	6.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Future Volume (veh/h)	58	32	121	50	52	26	166	512	62	18	219	362
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1841	1845	1863	1804	1900	1863	1835	1900	1900	1810	1810
Adj Flow Rate, veh/h	64	35	133	55	57	29	182	563	68	20	241	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	3	2	8	8	2	4	4	0	5	5
Cap, veh/h	159	87	217	210	134	68	236	1134	137	45	459	390
Arrive On Green	0.14	0.14	0.14	0.12	0.12	0.12	0.13	0.36	0.36	0.02	0.25	0.00
Sat Flow, veh/h	1153	630	1568	1774	1129	574	1774	3133	377	1810	1810	1538
Grp Volume(v), veh/h	99	0	133	55	0	86	182	313	318	20	241	0
Grp Sat Flow(s),veh/h/ln	1783	0	1568	1774	0	1703	1774	1743	1768	1810	1810	1538
Q Serve(g_s), s	2.0	0.0	3.2	1.1	0.0	1.9	4.0	5.6	5.6	0.4	4.6	0.0
Cycle Q Clear(g_c), s	2.0	0.0	3.2	1.1	0.0	1.9	4.0	5.6	5.6	0.4	4.6	0.0
Prop In Lane	0.65		1.00	1.00		0.34	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	217	210	0	202	236	631	640	45	459	390
V/C Ratio(X)	0.40	0.00	0.61	0.26	0.00	0.43	0.77	0.50	0.50	0.44	0.52	0.00
Avail Cap(c_a), veh/h	1133	0	997	814	0	781	862	1533	1555	293	1006	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.8	0.0	16.3	16.1	0.0	16.4	16.8	10.0	10.0	19.3	12.9	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.0	0.2	0.0	0.5	2.0	0.3	0.3	2.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.5	0.6	0.0	0.9	2.1	2.7	2.8	0.2	2.3	0.0
LnGrp Delay(d),s/veh	16.2	0.0	17.3	16.3	0.0	16.9	18.8	10.3	10.3	21.8	13.4	0.0
LnGrp LOS	B		B	B		B	B	B	B	C	B	
Approach Vol, veh/h		232			141			813			261	
Approach Delay, s/veh		16.8			16.7			12.2			14.0	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.0	18.2		9.0	8.3	13.9		8.9
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	35.3		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	2.4	7.6		5.2	6.0	6.6		3.9
Green Ext Time (p_c), s	0.0	4.1		0.5	0.2	3.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	26.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	393	347	88	80	309
Future Vol, veh/h	92	393	347	88	80	309
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	3	6	10	2
Mvmt Flow	101	432	381	97	88	340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	896	381	0	0	381	0
Stage 1	381	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.29	-
Pot Cap-1 Maneuver	311	662	-	-	1135	-
Stage 1	691	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	281	662	-	-	1135	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.2	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	527	1135	-
HCM Lane V/C Ratio	-	-	1.011	0.077	-
HCM Control Delay (s)	-	-	70.2	8.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	14.5	0.3	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	169	35	68	116	39	72
Future Vol, veh/h	169	35	68	116	39	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	9	7	3	18	6
Mvmt Flow	192	40	77	132	44	82

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	232	0	498	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	-	-	4.17	-	6.58	6.26
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.263	-	3.662	3.354
Pot Cap-1 Maneuver	-	-	1307	-	504	818
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1307	-	472	818
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	680	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	650	-	-	1307	-
HCM Lane V/C Ratio	0.194	-	-	0.059	-
HCM Control Delay (s)	11.9	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	201	110	250	187	21	161	442	214	28	954	173
Future Volume (veh/h)	108	201	110	250	187	21	161	442	214	28	954	173
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1743	1863	1743	1810	1727	1792	1810	1827	1863	1881
Adj Flow Rate, veh/h	115	214	117	266	199	22	171	470	228	30	1015	184
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	9	2	9	5	10	6	5	4	2	1
Cap, veh/h	144	341	282	340	357	311	204	1476	819	42	1181	668
Arrive On Green	0.08	0.19	0.19	0.10	0.20	0.20	0.12	0.43	0.43	0.02	0.33	0.33
Sat Flow, veh/h	1707	1792	1482	3442	1743	1518	1645	3406	1538	1740	3539	1599
Grp Volume(v), veh/h	115	214	117	266	199	22	171	470	228	30	1015	184
Grp Sat Flow(s),veh/h/ln	1707	1792	1482	1721	1743	1518	1645	1703	1538	1740	1770	1599
Q Serve(g_s), s	5.2	8.7	5.5	6.0	8.1	0.9	8.0	7.2	6.4	1.4	21.2	6.0
Cycle Q Clear(g_c), s	5.2	8.7	5.5	6.0	8.1	0.9	8.0	7.2	6.4	1.4	21.2	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	341	282	340	357	311	204	1476	819	42	1181	668
V/C Ratio(X)	0.80	0.63	0.42	0.78	0.56	0.07	0.84	0.32	0.28	0.71	0.86	0.28
Avail Cap(c_a), veh/h	162	545	450	340	537	467	219	1476	819	130	1242	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	29.4	28.1	34.7	28.2	25.3	33.8	14.7	10.1	38.2	24.6	15.1
Incr Delay (d2), s/veh	21.9	4.0	2.1	11.2	2.9	0.2	22.7	0.3	0.4	19.2	6.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	4.7	2.4	3.4	4.2	0.4	4.9	3.4	2.8	0.9	11.4	2.7
LnGrp Delay(d),s/veh	57.4	33.4	30.2	46.0	31.1	25.5	56.5	15.0	10.5	57.4	31.4	15.6
LnGrp LOS	E	C	C	D	C	C	E	B	B	E	C	B
Approach Vol, veh/h		446			487			869			1229	
Approach Delay, s/veh		38.8			39.0			22.0			29.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.4	39.7	12.3	20.5	14.3	31.8	11.1	21.7
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.9	32.3	7.8	24.0	10.5	27.7	7.5	24.3
Max Q Clear Time (g_c+I1), s	3.4	9.2	8.0	10.7	10.0	23.2	7.2	10.1
Green Ext Time (p_c), s	0.0	19.3	0.0	4.3	0.0	3.2	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	126	0	97	0	735	98	141	1173	1
Future Volume (vph)	0	0	104	126	0	97	0	735	98	141	1173	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	5.5
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)			1448	1770		1495		4893	1583	1736	3539	1615
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)			1448	1770		1495		4893	1583	1736	3539	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	134	0	103	0	782	104	150	1248	1
RTOR Reduction (vph)	0	0	104	0	0	77	0	0	54	0	0	0
Lane Group Flow (vph)	0	0	7	134	0	26	0	782	50	150	1248	1
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			3.0	4.9		12.4		19.0	23.9	5.1	28.1	28.1
Effective Green, g (s)			3.0	4.9		12.4		19.0	23.9	5.1	28.1	28.1
Actuated g/C Ratio			0.06	0.10		0.25		0.38	0.48	0.10	0.56	0.56
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	5.5
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	4.0
Lane Grp Cap (vph)			86	173		370		1859	756	177	1988	907
v/s Ratio Prot				c0.08				0.16	0.01	c0.09	c0.35	
v/s Ratio Perm			0.00			c0.02			0.02			0.00
v/c Ratio			0.08	0.77		0.07		0.42	0.07	0.85	0.63	0.00
Uniform Delay, d1			22.2	22.0		14.4		11.4	7.0	22.1	7.4	4.8
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2			0.4	19.2		0.1		0.2	0.0	28.4	0.7	0.0
Delay (s)			22.6	41.2		14.5		11.6	7.1	50.5	8.1	4.8
Level of Service			C	D		B		B	A	D	A	A
Approach Delay (s)		22.6			29.6			11.1			12.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	23	241	149	41	28	265	814	113	89	1311	96
Future Volume (veh/h)	109	23	241	149	41	28	265	814	113	89	1311	96
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1776	1881	1743	1845	1863
Adj Flow Rate, veh/h	114	24	251	155	43	29	276	848	118	93	1366	100
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	1	9	3	2
Cap, veh/h	141	225	317	185	270	236	312	1807	856	117	1483	661
Arrive On Green	0.09	0.13	0.13	0.11	0.16	0.16	0.18	0.54	0.54	0.07	0.42	0.42
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	3374	1598	1660	3505	1562
Grp Volume(v), veh/h	114	24	251	155	43	29	276	848	118	93	1366	100
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1687	1598	1660	1752	1562
Q Serve(g_s), s	7.6	1.4	11.1	10.3	2.4	1.8	17.6	17.4	4.1	6.2	41.1	4.4
Cycle Q Clear(g_c), s	7.6	1.4	11.1	10.3	2.4	1.8	17.6	17.4	4.1	6.2	41.1	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	225	317	185	270	236	312	1807	856	117	1483	661
V/C Ratio(X)	0.81	0.11	0.79	0.84	0.16	0.12	0.88	0.47	0.14	0.80	0.92	0.15
Avail Cap(c_a), veh/h	442	468	658	442	464	405	688	1807	856	297	1569	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	42.9	47.2	48.5	40.8	40.6	44.5	16.1	13.0	51.1	30.4	19.9
Incr Delay (d2), s/veh	10.3	0.2	4.5	9.5	0.3	0.2	8.2	0.4	0.2	11.6	9.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.7	3.9	5.2	1.2	0.8	9.0	8.1	1.9	3.2	21.9	1.9
LnGrp Delay(d),s/veh	60.5	43.1	51.7	58.1	41.1	40.8	52.7	16.5	13.2	62.8	40.0	20.1
LnGrp LOS	E	D	D	E	D	D	D	B	B	E	D	C
Approach Vol, veh/h		389			227			1242			1559	
Approach Delay, s/veh		53.7			52.6			24.2			40.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	64.8	16.6	18.4	24.4	52.3	13.6	21.4
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	8.2	19.4	12.3	13.1	19.6	43.1	9.6	4.4
Green Ext Time (p_c), s	0.1	28.4	0.4	1.3	0.8	4.1	0.3	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
9: Sierra College Blvd & I-80 WB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	89	632	71	330	108	884	197	0	1650	63
Future Volume (veh/h)	20	0	89	632	71	330	108	884	197	0	1650	63
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1759	1845	1805	1776	1827	1792	1681	0	1696	1900
Adj Flow Rate, veh/h	22	0	98	695	0	415	119	971	216	0	1813	69
Adj No. of Lanes	1	0	1	2	0	2	1	3	1	0	3	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	8	3	2	7	4	6	13	0	12	0
Cap, veh/h	39	0	0	766	0	467	459	3374	985	0	1733	604
Arrive On Green	0.02	0.00	0.00	0.22	0.00	0.15	0.53	1.00	1.00	0.00	0.37	0.37
Sat Flow, veh/h	1810	22		3514	0	3019	1740	4893	1429	0	4784	1615
Grp Volume(v), veh/h	22	62.7		695	0	415	119	971	216	0	1813	69
Grp Sat Flow(s),veh/h/ln	1810	E		1757	0	1509	1740	1631	1429	0	1544	1615
Q Serve(g_s), s	1.4			23.1	0.0	16.2	4.5	0.0	0.0	0.0	44.9	2.8
Cycle Q Clear(g_c), s	1.4			23.1	0.0	16.2	4.5	0.0	0.0	0.0	44.9	2.8
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	39			766	0	467	459	3374	985	0	1733	604
V/C Ratio(X)	0.56			0.91	0.00	0.89	0.26	0.29	0.22	0.00	1.05	0.11
Avail Cap(c_a), veh/h	92			1467	0	981	459	3374	985	0	1733	604
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.49	0.49
Uniform Delay (d), s/veh	58.1			45.7	0.0	49.7	21.9	0.0	0.0	0.0	37.5	16.6
Incr Delay (d2), s/veh	4.6			1.8	0.0	2.4	0.1	0.2	0.5	0.0	29.0	0.2
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8			11.4	0.0	6.9	2.1	0.1	0.1	0.0	23.8	1.3
LnGrp Delay(d),s/veh	62.7			47.5	0.0	52.1	22.1	0.2	0.5	0.0	66.6	16.8
LnGrp LOS	E			D		D	C	A	A		F	B
Approach Vol, veh/h					1110			1306			1882	
Approach Delay, s/veh					49.2			2.3			64.8	
Approach LOS					D			A			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		88.9	31.1		37.8	51.1	7.2	23.9
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		58.8	50.1		9.2	* 45	6.1	39.0
Max Q Clear Time (g_c+I1), s		2.0	25.1		6.5	46.9	3.4	18.2
Green Ext Time (p_c), s		3.1	0.5		1.1	0.0	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	41.9
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
10: Sierra College Blvd & I-80 EB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	420	104	203	46	0	111	0	1026	33	195	1256	357
Future Volume (veh/h)	420	104	203	46	0	111	0	1026	33	195	1256	357
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1845	1776	1845	0	1863	0	1667	1792	1863	1863	1743
Adj Flow Rate, veh/h	483	120	233	53	0	128	0	1179	38	224	1444	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	7	3	7	3	0	2	0	14	6	2	2	9
Cap, veh/h	846	600	258	85	0	0	0	1328	353	1269	2308	966
Arrive On Green	0.26	0.17	0.17	0.05	0.00	0.00	0.00	0.46	0.46	0.74	1.00	0.00
Sat Flow, veh/h	3281	3505	1509	1757	53		0	5967	1524	3442	3539	1482
Grp Volume(v), veh/h	483	120	233	53	58.8		0	1179	38	224	1444	0
Grp Sat Flow(s),veh/h/ln	1640	1752	1509	1757	E		0	1433	1524	1721	1770	1482
Q Serve(g_s), s	15.4	3.5	18.2	3.6			0.0	22.5	1.4	2.4	0.0	0.0
Cycle Q Clear(g_c), s	15.4	3.5	18.2	3.6			0.0	22.5	1.4	2.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	846	600	258	85			0	1328	353	1269	2308	966
V/C Ratio(X)	0.57	0.20	0.90	0.62			0.00	0.89	0.11	0.18	0.63	0.00
Avail Cap(c_a), veh/h	846	1227	528	108			0	1787	475	1269	2308	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.7	42.7	48.7	56.0			0.0	30.8	16.9	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.1	4.6	2.8			0.0	8.8	0.6	0.0	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	1.7	7.9	1.8			0.0	9.6	0.6	1.1	0.4	0.0
LnGrp Delay(d),s/veh	39.5	42.7	53.4	58.8			0.0	39.6	17.5	10.3	1.3	0.0
LnGrp LOS	D	D	D	E				D	B	B	A	
Approach Vol, veh/h		836						1217			1668	
Approach Delay, s/veh		43.8						38.9			2.5	
Approach LOS		D						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	50.5	34.0	10.4	25.1		84.5	35.5	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	13.2	* 37	7.4	42.0		55.2	23.3	
Max Q Clear Time (g_c+I1), s	4.4	24.5	5.6	20.2		2.0	17.4	
Green Ext Time (p_c), s	3.6	3.3	0.0	0.4		5.3	0.8	

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	5	120	0	176	7	876	60	0	1460	13
Future Volume (veh/h)	7	0	5	120	0	176	7	876	60	0	1460	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1900	1532	1863	1778	1900	0	1810	1863
Adj Flow Rate, veh/h	8	0	5	148	0	217	8	1081	74	0	1802	14
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.81	0.92	0.81	0.92	0.81	0.81	0.81	0.81	0.92
Percent Heavy Veh, %	2	2	2	2	2	24	2	7	7	0	5	2
Cap, veh/h	26	0	23	271	0	195	17	4259	290	0	2323	1070
Arrive On Green	0.01	0.00	0.01	0.15	0.00	0.15	0.01	0.72	0.72	0.00	1.00	1.00
Sat Flow, veh/h	1774	0	1583	1810	0	1302	1774	5892	401	0	3529	1583
Grp Volume(v), veh/h	8	0	5	148	0	217	8	840	315	0	1802	14
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1810	0	1302	1774	1529	1707	0	1719	1583
Q Serve(g_s), s	0.5	0.0	0.4	9.1	0.0	18.0	0.5	7.5	7.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.4	9.1	0.0	18.0	0.5	7.5	7.5	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	0.00		1.00
Lane Grp Cap(c), veh/h	26	0	23	271	0	195	17	3316	1234	0	2323	1070
V/C Ratio(X)	0.31	0.00	0.22	0.55	0.00	1.11	0.46	0.25	0.26	0.00	0.78	0.01
Avail Cap(c_a), veh/h	266	0	237	271	0	195	74	3316	1234	0	2323	1070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.95	0.95	0.95	0.00	0.76	0.76
Uniform Delay (d), s/veh	58.5	0.0	58.4	47.2	0.0	51.0	59.1	5.6	5.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.5	0.0	4.5	2.3	0.0	97.2	17.2	0.2	0.5	0.0	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.2	4.7	0.0	11.7	0.3	3.2	3.7	0.0	0.6	0.0
LnGrp Delay(d),s/veh	65.0	0.0	63.0	49.5	0.0	148.2	76.3	5.8	6.1	0.0	2.0	0.0
LnGrp LOS	E		E	D		F	E	A	A		A	A
Approach Vol, veh/h		13			365			1163			1816	
Approach Delay, s/veh		64.2			108.2			6.4			2.0	
Approach LOS		E			F			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		91.2		6.3	5.7	85.6		22.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		70.5		18.0	5.0	61.0		18.0
Max Q Clear Time (g_c+I1), s		9.5		2.5	2.5	2.0		20.0
Green Ext Time (p_c), s		47.2		0.0	0.0	46.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	1	38	1	8	0	933	25	40	1542	3
Future Volume (veh/h)	2	0	1	38	1	8	0	933	25	40	1542	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1267	1900	1900	1597	1900	1520	1900	1792	1743	1387	1827	1429
Adj Flow Rate, veh/h	2	0	1	48	1	10	0	1166	31	50	1928	4
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	50	0	0	19	0	25	0	6	9	37	4	33
Cap, veh/h	3	0	2	115	71	49	2	3403	1030	57	2738	957
Arrive On Green	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.70	0.70	0.04	0.79	0.79
Sat Flow, veh/h	1206	0	1615	2950	1900	1292	1810	4893	1481	1321	3471	1214
Grp Volume(v), veh/h	2	0	1	48	1	10	0	1166	31	50	1928	4
Grp Sat Flow(s),veh/h/ln	1206	0	1615	1475	1900	1292	1810	1631	1481	1321	1736	1214
Q Serve(g_s), s	0.1	0.0	0.1	1.4	0.0	0.7	0.0	8.5	0.6	3.4	23.6	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	1.4	0.0	0.7	0.0	8.5	0.6	3.4	23.6	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	3	0	2	115	71	49	2	3403	1030	57	2738	957
V/C Ratio(X)	0.61	0.00	0.45	0.42	0.01	0.21	0.00	0.34	0.03	0.88	0.70	0.00
Avail Cap(c_a), veh/h	67	0	614	198	743	505	101	3703	1120	185	2918	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.6	0.0	44.6	42.0	41.5	41.8	0.0	5.5	4.2	42.6	4.5	2.0
Incr Delay (d2), s/veh	113.6	0.0	118.0	2.4	0.1	2.5	0.0	0.1	0.0	31.7	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	0.6	0.0	0.3	0.0	3.8	0.2	1.7	11.3	0.0
LnGrp Delay(d),s/veh	158.2	0.0	162.6	44.4	41.5	44.2	0.0	5.5	4.3	74.2	5.3	2.0
LnGrp LOS	F		F	D	D	D		A	A	E	A	A
Approach Vol, veh/h		3			59			1197			1982	
Approach Delay, s/veh		159.6			44.3			5.5			7.0	
Approach LOS		F			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	68.0	8.0	5.1	0.0	76.4	4.7	8.4
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	12.5	67.7	6.0	34.0	5.0	75.2	5.0	35.0
Max Q Clear Time (g_c+I1), s	5.4	10.5	3.4	2.1	0.0	25.6	2.1	2.7
Green Ext Time (p_c), s	0.0	51.1	0.0	0.0	0.0	44.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.3
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	8	73	906	1401	304
Future Volume (veh/h)	22	8	73	906	1401	304
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1900	1900	1810	1825	1900
Adj Flow Rate, veh/h	29	11	96	1192	1843	400
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	5	0	0	5	5	5
Cap, veh/h	135	65	124	2720	2668	568
Arrive On Green	0.04	0.04	0.07	0.79	0.65	0.65
Sat Flow, veh/h	3343	1615	1810	3529	4280	876
Grp Volume(v), veh/h	29	11	96	1192	1480	763
Grp Sat Flow(s),veh/h/ln	1672	1615	1810	1719	1661	1670
Q Serve(g_s), s	0.5	0.4	3.2	6.7	17.1	17.9
Cycle Q Clear(g_c), s	0.5	0.4	3.2	6.7	17.1	17.9
Prop In Lane	1.00	1.00	1.00			0.52
Lane Grp Cap(c), veh/h	135	65	124	2720	2153	1082
V/C Ratio(X)	0.21	0.17	0.77	0.44	0.69	0.70
Avail Cap(c_a), veh/h	1076	520	194	2855	2155	1083
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	28.1	27.7	2.0	6.8	6.9
Incr Delay (d2), s/veh	0.8	1.2	9.8	0.1	1.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	1.9	3.0	7.9	8.7
LnGrp Delay(d),s/veh	28.9	29.3	37.5	2.2	7.7	9.1
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	40			1288	2243	
Approach Delay, s/veh	29.0			4.8	8.2	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		6.9	8.7	45.0				53.6
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		19.5	6.5	39.3				50.3
Max Q Clear Time (g_c+I1), s		2.5	5.2	19.9				8.7
Green Ext Time (p_c), s		0.1	0.0	18.8				39.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	306	296	125	345	165	430	697	90	148	835	246
Future Volume (veh/h)	130	306	296	125	345	165	430	697	90	148	835	246
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1863	1845	1900	1863	1900	1881	1779	1900	1696	1827	1827
Adj Flow Rate, veh/h	157	369	357	151	416	199	518	840	108	178	1006	296
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	6	2	3	0	2	2	1	7	7	12	4	4
Cap, veh/h	188	1104	484	97	591	279	262	938	121	191	1768	539
Arrive On Green	0.11	0.31	0.31	0.05	0.26	0.26	0.08	0.31	0.31	0.12	0.35	0.35
Sat Flow, veh/h	1707	3539	1553	1810	2314	1093	3476	3011	387	1616	4988	1522
Grp Volume(v), veh/h	157	369	357	151	317	298	518	472	476	178	1006	296
Grp Sat Flow(s),veh/h/ln	1707	1770	1553	1810	1770	1638	1738	1691	1707	1616	1663	1522
Q Serve(g_s), s	8.4	7.4	19.1	5.0	15.1	15.4	7.0	24.8	24.8	10.1	15.2	14.5
Cycle Q Clear(g_c), s	8.4	7.4	19.1	5.0	15.1	15.4	7.0	24.8	24.8	10.1	15.2	14.5
Prop In Lane	1.00		1.00	1.00		0.67	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	188	1104	484	97	452	418	262	527	532	191	1768	539
V/C Ratio(X)	0.83	0.33	0.74	1.55	0.70	0.71	1.98	0.90	0.90	0.93	0.57	0.55
Avail Cap(c_a), veh/h	220	1181	518	97	457	423	262	528	533	191	1771	540
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	24.6	28.6	44.0	31.4	31.5	43.0	30.5	30.5	40.6	24.2	24.0
Incr Delay (d2), s/veh	20.6	0.6	8.4	292.0	5.2	6.0	453.7	19.7	19.6	45.7	0.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	3.7	9.3	10.4	8.0	7.7	19.8	14.4	14.5	7.0	7.0	6.3
LnGrp Delay(d),s/veh	61.1	25.2	37.0	335.9	36.6	37.5	496.6	50.3	50.1	86.2	24.8	25.5
LnGrp LOS	E	C	D	F	D	D	F	D	D	F	C	C
Approach Vol, veh/h		883			766			1466			1480	
Approach Delay, s/veh		36.4			96.0			207.9			32.3	
Approach LOS		D			F			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	33.9	9.0	35.0	11.0	37.9	14.3	29.7
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	29.0	5.0	31.0	7.0	33.0	12.0	24.0
Max Q Clear Time (g_c+I1), s	12.1	26.8	7.0	21.1	9.0	17.2	10.4	17.4
Green Ext Time (p_c), s	0.0	2.2	0.0	7.6	0.0	14.6	0.1	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	99.7
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	21	170	71	67	51	125	405	79	36	401	47
Future Volume (veh/h)	51	21	170	71	67	51	125	405	79	36	401	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1535	1484	1900	1695	1792	1712	1739	1900	1387	1776	1727
Adj Flow Rate, veh/h	56	23	187	78	74	56	137	445	87	40	441	52
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	33	33	28	9	9	6	11	7	7	37	7	10
Cap, veh/h	91	19	481	80	47	580	166	528	103	52	552	446
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.10	0.37	0.37	0.04	0.31	0.31
Sat Flow, veh/h	0	49	1260	0	124	1522	1630	1413	276	1321	1776	1435
Grp Volume(v), veh/h	79	0	187	152	0	56	137	0	532	40	441	52
Grp Sat Flow(s),veh/h/ln	49	0	1260	124	0	1522	1630	0	1689	1321	1776	1435
Q Serve(g_s), s	0.0	0.0	7.3	0.0	0.0	1.6	5.6	0.0	19.6	2.0	15.5	1.8
Cycle Q Clear(g_c), s	25.9	0.0	7.3	25.9	0.0	1.6	5.6	0.0	19.6	2.0	15.5	1.8
Prop In Lane	0.71		1.00	0.51		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	109	0	481	128	0	580	166	0	631	52	552	446
V/C Ratio(X)	0.72	0.00	0.39	1.19	0.00	0.10	0.83	0.00	0.84	0.78	0.80	0.12
Avail Cap(c_a), veh/h	109	0	481	128	0	580	166	0	631	105	607	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	15.3	24.7	0.0	13.5	29.9	0.0	19.5	32.3	21.5	16.7
Incr Delay (d2), s/veh	21.6	0.0	0.6	140.2	0.0	0.1	28.3	0.0	11.5	24.6	9.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	2.6	7.3	0.0	0.7	3.8	0.0	11.0	1.1	8.9	0.7
LnGrp Delay(d),s/veh	49.6	0.0	15.9	164.9	0.0	13.6	58.2	0.0	31.0	56.9	30.6	17.0
LnGrp LOS	D		B	F		B	E		C	E	C	B
Approach Vol, veh/h		266			208			669			533	
Approach Delay, s/veh		25.9			124.2			36.5			31.3	
Approach LOS		C			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	30.8		30.4	11.0	26.5		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.4	24.7		25.9	6.9	23.2		25.9
Max Q Clear Time (g_c+I1), s	4.0	21.6		27.9	7.6	17.5		27.9
Green Ext Time (p_c), s	0.0	2.5		0.0	0.0	3.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.0
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	117	75	542	164	140	45	500	586	294	615	23
Future Volume (veh/h)	29	117	75	542	164	140	45	500	586	294	615	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1881	1900	1845	1837	1863	1863	1792	1863	1827	1780	1900
Adj Flow Rate, veh/h	32	130	83	392	476	156	50	556	651	327	683	26
Adj No. of Lanes	1	2	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	1	3	4	2	2	6	2	4	7	7
Cap, veh/h	155	214	128	463	484	415	64	967	449	352	1493	57
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.04	0.28	0.28	0.20	0.45	0.45
Sat Flow, veh/h	1547	2143	1277	1757	1837	1574	1774	3406	1580	1740	3319	126
Grp Volume(v), veh/h	32	107	106	392	476	156	50	556	651	327	348	361
Grp Sat Flow(s),veh/h/ln	1547	1787	1633	1757	1837	1574	1774	1703	1580	1740	1691	1754
Q Serve(g_s), s	2.3	7.1	7.7	26.1	31.7	10.0	3.4	17.2	35.0	22.8	17.6	17.6
Cycle Q Clear(g_c), s	2.3	7.1	7.7	26.1	31.7	10.0	3.4	17.2	35.0	22.8	17.6	17.6
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	155	179	163	463	484	415	64	967	449	352	761	789
V/C Ratio(X)	0.21	0.60	0.65	0.85	0.98	0.38	0.78	0.57	1.45	0.93	0.46	0.46
Avail Cap(c_a), veh/h	351	406	371	463	484	415	130	967	449	367	761	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	53.1	53.4	43.0	45.1	37.1	58.9	37.7	44.1	48.3	23.5	23.5
Incr Delay (d2), s/veh	0.7	3.2	4.3	13.5	36.3	0.6	17.7	1.0	215.0	29.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.6	3.7	14.4	21.0	4.4	2.0	8.2	42.0	13.8	8.3	8.7
LnGrp Delay(d),s/veh	51.6	56.3	57.7	56.5	81.4	37.6	76.6	38.8	259.1	77.6	24.1	24.1
LnGrp LOS	D	E	E	E	F	D	E	D	F	E	C	C
Approach Vol, veh/h		245			1024			1257			1036	
Approach Delay, s/veh		56.3			65.2			154.4			41.0	
Approach LOS		E			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	28.9	40.0		17.3	8.5	60.4		37.0
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	26.0	35.0		28.0	9.0	52.0		32.5
Max Q Clear Time (g_c+I1), s	24.8	37.0		9.7	5.4	19.6		33.7
Green Ext Time (p_c), s	0.1	0.0		1.2	0.0	20.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	89.0
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	976	13	17	794	558	12	16	6	356	11	146
Future Volume (veh/h)	157	976	13	17	794	558	12	16	6	356	11	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1792	1863	1827	1900	1675	1900	1759	1767	1776
Adj Flow Rate, veh/h	180	1122	15	20	913	0	14	18	7	418	0	168
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	1	1	6	2	4	0	12	12	8	0	7
Cap, veh/h	219	1614	22	31	1210	531	181	115	45	641	0	287
Arrive On Green	0.12	0.45	0.45	0.02	0.34	0.00	0.10	0.10	0.10	0.19	0.00	0.19
Sat Flow, veh/h	1774	3612	48	1707	3539	1553	1810	1145	445	3351	0	1500
Grp Volume(v), veh/h	180	555	582	20	913	0	14	0	25	418	0	168
Grp Sat Flow(s),veh/h/ln	1774	1787	1873	1707	1770	1553	1810	0	1591	1675	0	1500
Q Serve(g_s), s	7.9	19.9	19.9	0.9	18.3	0.0	0.6	0.0	1.1	9.2	0.0	8.2
Cycle Q Clear(g_c), s	7.9	19.9	19.9	0.9	18.3	0.0	0.6	0.0	1.1	9.2	0.0	8.2
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	219	799	837	31	1210	531	181	0	159	641	0	287
V/C Ratio(X)	0.82	0.69	0.70	0.65	0.75	0.00	0.08	0.00	0.16	0.65	0.00	0.59
Avail Cap(c_a), veh/h	277	799	837	109	1239	544	181	0	159	1341	0	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.2	17.7	17.7	39.0	23.3	0.0	32.6	0.0	32.9	29.9	0.0	29.5
Incr Delay (d2), s/veh	14.6	4.3	4.1	21.1	3.9	0.0	0.8	0.0	2.1	1.6	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	10.7	11.1	0.6	9.5	0.0	0.3	0.0	0.6	4.4	0.0	3.6
LnGrp Delay(d),s/veh	48.8	22.1	21.9	60.1	27.3	0.0	33.5	0.0	35.0	31.5	0.0	32.2
LnGrp LOS	D	C	C	E	C		C		C	C		C
Approach Vol, veh/h		1317			933			39			586	
Approach Delay, s/veh		25.6			28.0			34.5			31.7	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		13.0	5.9	40.7		20.3	14.4	32.3
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		8.0	5.1	35.4		32.0	12.5	28.0
Max Q Clear Time (g_c+I1), s		3.1	2.9	21.9		11.2	9.9	20.3
Green Ext Time (p_c), s		0.0	0.0	12.9		3.3	0.1	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	890	518	411	1218	0	0	0	0	46	0	220
Future Volume (veh/h)	0	890	518	411	1218	0	0	0	0	46	0	220
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1810	1881	1845	0				1827	1827	1900
Adj Flow Rate, veh/h	0	1000	582	462	1369	0				52	0	247
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	5	1	3	0				4	0	4
Cap, veh/h	0	1356	588	482	2503	0				320	0	285
Arrive On Green	0.00	0.38	0.38	0.54	1.00	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3632	1534	1792	3597	0				1740	0	1553
Grp Volume(v), veh/h	0	1000	582	462	1369	0				52	0	247
Grp Sat Flow(s),veh/h/ln	0	1770	1534	1792	1752	0				1740	0	1553
Q Serve(g_s), s	0.0	21.9	33.9	22.2	0.0	0.0				2.3	0.0	13.9
Cycle Q Clear(g_c), s	0.0	21.9	33.9	22.2	0.0	0.0				2.3	0.0	13.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1356	588	482	2503	0				320	0	285
V/C Ratio(X)	0.00	0.74	0.99	0.96	0.55	0.00				0.16	0.00	0.87
Avail Cap(c_a), veh/h	0	1356	588	486	2503	0				445	0	397
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.70	0.70	0.25	0.25	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.9	27.6	20.3	0.0	0.0				30.9	0.0	35.7
Incr Delay (d2), s/veh	0.0	2.5	28.7	12.2	0.2	0.0				0.1	0.0	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.2	18.9	12.4	0.1	0.0				1.1	0.0	6.8
LnGrp Delay(d),s/veh	0.0	26.4	56.3	32.6	0.2	0.0				31.0	0.0	46.2
LnGrp LOS		C	E	C	A					C		D
Approach Vol, veh/h		1582			1831						299	
Approach Delay, s/veh		37.4			8.4						43.6	
Approach LOS		D			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.8	39.6		20.6		69.4		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	24.4	27.8		23.0		57.8		
Max Q Clear Time (g_c+I1), s	24.2	35.9		15.9		2.0		
Green Ext Time (p_c), s	0.0	0.0		0.6		25.6		

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	733	0	0	977	57	652	2	853	0	0	0
Future Volume (veh/h)	203	733	0	0	977	57	652	2	853	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1863	0	0	1863	1900	1845	1872	1881			
Adj Flow Rate, veh/h	226	814	0	0	1086	63	1055	0	595			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	2	0	0	2	2	3	0	1			
Cap, veh/h	254	1903	0	0	1204	70	1284	0	585			
Arrive On Green	0.29	1.00	0.00	0.00	0.35	0.35	0.37	0.00	0.37			
Sat Flow, veh/h	1757	3632	0	0	3493	197	3514	0	1599			
Grp Volume(v), veh/h	226	814	0	0	565	584	1055	0	595			
Grp Sat Flow(s),veh/h/ln	1757	1770	0	0	1770	1828	1757	0	1599			
Q Serve(g_s), s	11.1	0.0	0.0	0.0	27.3	27.3	24.5	0.0	32.9			
Cycle Q Clear(g_c), s	11.1	0.0	0.0	0.0	27.3	27.3	24.5	0.0	32.9			
Prop In Lane	1.00		0.00	0.00		0.11	1.00		1.00			
Lane Grp Cap(c), veh/h	254	1903	0	0	627	647	1284	0	585			
V/C Ratio(X)	0.89	0.43	0.00	0.00	0.90	0.90	0.82	0.00	1.02			
Avail Cap(c_a), veh/h	256	1903	0	0	627	647	1284	0	585			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.62	0.62	0.00	0.00	0.86	0.86	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.3	0.0	0.0	0.0	27.6	27.6	25.9	0.0	28.6			
Incr Delay (d2), s/veh	19.7	0.4	0.0	0.0	16.5	16.2	4.6	0.0	41.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.7	0.1	0.0	0.0	16.2	16.7	12.7	0.0	21.2			
LnGrp Delay(d),s/veh	51.0	0.4	0.0	0.0	44.1	43.8	30.5	0.0	70.4			
LnGrp LOS	D	A			D	D	C		F			
Approach Vol, veh/h		1040			1149			1650				
Approach Delay, s/veh		11.4			43.9			44.9				
Approach LOS		B			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		53.0			16.5	36.5		37.0
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		48.4			13.1	31.8		32.9
Max Q Clear Time (g_c+I1), s		2.0			13.1	29.3		34.9
Green Ext Time (p_c), s		13.1			0.0	2.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1491	61	11	893	0	140	0	26	0	0	0
Future Volume (veh/h)	49	1491	61	11	893	0	140	0	26	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1875	1900	1583	1863	0	1845	0	1638			
Adj Flow Rate, veh/h	56	1714	70	13	1026	0	161	0	30			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Percent Heavy Veh, %	0	1	1	20	2	0	3	0	16			
Cap, veh/h	101	2381	97	19	2266	0	210	0	166			
Arrive On Green	0.06	0.68	0.68	0.01	0.64	0.00	0.12	0.00	0.12			
Sat Flow, veh/h	1810	3485	142	1508	3632	0	1757	0	1392			
Grp Volume(v), veh/h	56	871	913	13	1026	0	161	0	30			
Grp Sat Flow(s),veh/h/ln	1810	1781	1846	1508	1770	0	1757	0	1392			
Q Serve(g_s), s	2.2	22.2	22.7	0.6	10.7	0.0	6.5	0.0	1.4			
Cycle Q Clear(g_c), s	2.2	22.2	22.7	0.6	10.7	0.0	6.5	0.0	1.4			
Prop In Lane	1.00		0.08	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	101	1217	1261	19	2266	0	210	0	166			
V/C Ratio(X)	0.56	0.72	0.72	0.68	0.45	0.00	0.77	0.00	0.18			
Avail Cap(c_a), veh/h	173	1217	1261	115	2333	0	512	0	406			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.6	7.2	7.3	35.9	6.7	0.0	31.2	0.0	29.0			
Incr Delay (d2), s/veh	4.7	2.8	2.8	34.7	0.4	0.0	5.8	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	11.6	12.2	0.4	5.3	0.0	3.5	0.0	0.6			
LnGrp Delay(d),s/veh	38.3	10.0	10.1	70.6	7.1	0.0	37.0	0.0	29.5			
LnGrp LOS	D	A	B	E	A		D		C			
Approach Vol, veh/h		1840			1039			191				
Approach Delay, s/veh		10.9			7.8			35.8				
Approach LOS		B			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.9	55.0			8.1	51.8		13.2
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	49.6			7.0	48.2		21.3
Max Q Clear Time (g_c+I1), s	2.6	24.7			4.2	12.7		8.5
Green Ext Time (p_c), s	0.0	24.6			0.0	34.1		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	833	1398	4
Future Vol, veh/h	0	0	16	833	1398	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	877	1472	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	738	1476	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	365	462	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	365	462	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	462	-	-	-	-
HCM Lane V/C Ratio	0.036	-	-	-	-
HCM Control Delay (s)	13.1	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	99	126	92	171	278	96
Future Vol, veh/h	99	126	92	171	278	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	137	100	186	302	104

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	647	203	407	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	404	804	1148	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	369	804	1148	-	-	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	667	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1148	-	369	804	-	-
HCM Lane V/C Ratio	0.087	-	0.292	0.17	-	-
HCM Control Delay (s)	8.4	-	18.7	10.4	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.2	0.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	524	923	41	13	636	135	161	13	21	12	4	63
Future Volume (veh/h)	524	923	41	13	636	135	161	13	21	12	4	63
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	570	1003	45	14	691	147	175	14	23	13	42	42
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	613	1632	73	263	834	177	221	79	130	22	72	81
Arrive On Green	0.35	0.47	0.47	0.15	0.29	0.29	0.12	0.12	0.12	0.05	0.05	0.05
Sat Flow, veh/h	1774	3450	155	1774	2906	618	1774	635	1043	435	1406	1583
Grp Volume(v), veh/h	570	514	534	14	421	417	175	0	37	55	0	42
Grp Sat Flow(s),veh/h/ln	1774	1770	1835	1774	1770	1754	1774	0	1679	1841	0	1583
Q Serve(g_s), s	27.5	19.2	19.2	0.6	19.7	19.8	8.5	0.0	1.8	2.6	0.0	2.3
Cycle Q Clear(g_c), s	27.5	19.2	19.2	0.6	19.7	19.8	8.5	0.0	1.8	2.6	0.0	2.3
Prop In Lane	1.00		0.08	1.00		0.35	1.00		0.62	0.24		1.00
Lane Grp Cap(c), veh/h	613	837	868	263	508	503	221	0	210	94	0	81
V/C Ratio(X)	0.93	0.61	0.61	0.05	0.83	0.83	0.79	0.00	0.18	0.58	0.00	0.52
Avail Cap(c_a), veh/h	719	1156	1199	263	538	533	599	0	567	104	0	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	17.4	17.4	32.5	29.6	29.6	37.7	0.0	34.8	41.2	0.0	41.1
Incr Delay (d2), s/veh	17.0	2.7	2.6	0.1	13.2	13.4	6.2	0.0	0.4	6.8	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.4	9.9	10.3	0.3	11.4	11.4	4.6	0.0	0.8	1.5	0.0	1.1
LnGrp Delay(d),s/veh	45.1	20.0	20.0	32.5	42.8	43.0	43.9	0.0	35.2	48.0	0.0	46.1
LnGrp LOS	D	C	B	C	D	D	D		D	D		D
Approach Vol, veh/h		1618			852			212			97	
Approach Delay, s/veh		28.8			42.8			42.4			47.2	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.2	47.0		15.1	34.7	30.5		8.5
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 58		30.0	36.0	27.0		5.0
Max Q Clear Time (g_c+I1), s	2.6	21.2		10.5	29.5	21.8		4.6
Green Ext Time (p_c), s	1.8	20.8		0.6	1.2	3.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	153	54	795	155	54	1344
Future Volume (veh/h)	153	54	795	155	54	1344
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	166	59	864	168	59	1461
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	348	160	2810	1035	102	2499
Arrive On Green	0.10	0.10	0.55	0.55	0.06	0.71
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	166	59	864	168	59	1461
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	2.1	1.6	4.3	1.9	1.5	9.7
Cycle Q Clear(g_c), s	2.1	1.6	4.3	1.9	1.5	9.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	348	160	2810	1035	102	2499
V/C Ratio(X)	0.48	0.37	0.31	0.16	0.58	0.58
Avail Cap(c_a), veh/h	1326	610	2810	1035	239	2499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	19.6	5.6	3.1	21.5	3.4
Incr Delay (d2), s/veh	1.0	1.4	0.3	0.3	5.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.8	2.1	1.2	0.9	4.8
LnGrp Delay(d),s/veh	20.8	21.0	5.9	3.5	26.6	4.4
LnGrp LOS	C	C	A	A	C	A
Approach Vol, veh/h	225		1032			1520
Approach Delay, s/veh	20.9		5.5			5.3
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	30.3				37.5		9.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	6.3	22.2				33.0		18.0
Max Q Clear Time (g_c+I1), s	3.5	6.3				11.7		4.1
Green Ext Time (p_c), s	0.0	13.4				17.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	239	0	0	223	0	0
Future Vol, veh/h	239	0	0	223	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	0	0	242	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	260
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	779
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	779
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Intersection Delay, s/veh	43.3
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	250	532	159	228	0	305	0	79	1	0	1
Future Vol, veh/h	0	250	532	159	228	0	305	0	79	1	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	13	5	7	13	0	9	0	4	0	0	0
Mvmt Flow	0	278	591	177	253	0	339	0	88	1	0	1
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	61.8	18.2	30.9	12.2
HCM LOS	F	C	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	50%
Vol Thru, %	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	100%	0%	100%	0%	0%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	305	79	250	532	159	228	2
LT Vol	305	0	0	0	159	0	1
Through Vol	0	0	250	0	0	228	0
RT Vol	0	79	0	532	0	0	1
Lane Flow Rate	339	88	278	591	177	253	2
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.786	0.17	0.567	1.066	0.399	0.543	0.006
Departure Headway (Hd)	8.481	7.094	7.347	6.49	8.284	7.874	9.139
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	430	509	494	562	436	461	394
Service Time	6.181	4.794	5.047	4.19	5.984	5.574	7.139
HCM Lane V/C Ratio	0.788	0.173	0.563	1.052	0.406	0.549	0.005
HCM Control Delay	36	11.2	19.2	81.8	16.4	19.5	12.2
HCM Lane LOS	E	B	C	F	C	C	B
HCM 95th-tile Q	6.9	0.6	3.5	17.4	1.9	3.2	0

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	79	426	5	111	978
Future Vol, veh/h	4	79	426	5	111	978
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	9	0	1	3
Mvmt Flow	4	87	468	5	122	1075

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1790	471	0	0	474	0
Stage 1	471	-	-	-	-	-
Stage 2	1319	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	90	597	-	-	1093	-
Stage 1	632	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	80	597	-	-	1093	-
Mov Cap-2 Maneuver	80	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	224	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	455	1093	-
HCM Lane V/C Ratio	-	-	0.2	0.112	-
HCM Control Delay (s)	-	-	14.9	8.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.4	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	40	2	3	2	427	42	3	991	2
Future Vol, veh/h	1	1	1	40	2	3	2	427	42	3	991	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	1	1	1	47	2	4	2	502	49	4	1166	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1682	1681	1167	1682	1682	502	1168	0	0	502	0	0
Stage 1	1174	1174	-	507	507	-	-	-	-	-	-	-
Stage 2	508	507	-	1175	1175	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	76	96	238	76	95	573	605	-	-	1073	-	-
Stage 1	236	268	-	552	543	-	-	-	-	-	-	-
Stage 2	551	543	-	236	268	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	95	238	75	94	573	605	-	-	1073	-	-
Mov Cap-2 Maneuver	74	95	-	75	94	-	-	-	-	-	-	-
Stage 1	235	267	-	550	541	-	-	-	-	-	-	-
Stage 2	543	541	-	233	267	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.8	108.4	0	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	605	-	-	83	238	76	573	1073	-	-
HCM Lane V/C Ratio	0.004	-	-	0.028	0.005	0.65	0.006	0.003	-	-
HCM Control Delay (s)	11	-	-	49.6	20.2	115.3	11.3	8.4	-	-
HCM Lane LOS	B	-	-	E	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	3	0	0	-	-

Intersection	
Intersection Delay, s/veh	23.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	22	182	105	26	10	82	176	25	5	289	99
Future Vol, veh/h	97	22	182	105	26	10	82	176	25	5	289	99
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	4	9	6	0	0	0	5	8	4	0	3	8
Mvmt Flow	120	27	225	130	32	12	101	217	31	6	357	122
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	17.9	20	20.9	32
HCM LOS	C	C	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	82%	0%	74%	100%	0%	0%
Vol Thru, %	0%	88%	18%	0%	18%	0%	100%	0%
Vol Right, %	0%	12%	0%	100%	7%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	201	119	182	141	5	289	99
LT Vol	82	0	97	0	105	5	0	0
Through Vol	0	176	22	0	26	0	289	0
RT Vol	0	25	0	182	10	0	0	99
Lane Flow Rate	101	248	147	225	174	6	357	122
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.258	0.594	0.369	0.499	0.457	0.015	0.818	0.259
Departure Headway (Hd)	9.176	8.619	9.053	8.001	9.445	8.712	8.249	7.614
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	392	419	398	449	381	411	439	472
Service Time	6.933	6.375	6.808	5.757	7.206	6.461	5.998	5.364
HCM Lane V/C Ratio	0.258	0.592	0.369	0.501	0.457	0.015	0.813	0.258
HCM Control Delay	15.1	23.3	17	18.5	20	11.6	38.8	13
HCM Lane LOS	C	C	C	C	C	B	E	B
HCM 95th-tile Q	1	3.7	1.7	2.7	2.3	0	7.6	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	17	292	593	0
Future Vol, veh/h	0	9	17	292	593	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	6	5	0
Mvmt Flow	0	12	23	395	801	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1242	801	801	0	-	0
Stage 1	801	-	-	-	-	-
Stage 2	441	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	195	388	831	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	190	388	831	-	-	-
Mov Cap-2 Maneuver	190	-	-	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	635	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	831	-	388	-	-
HCM Lane V/C Ratio	0.028	-	0.031	-	-
HCM Control Delay (s)	9.5	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	65.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	86	114	195	127	242	360
Future Vol, veh/h	86	114	195	127	242	360
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	0	0	4	2	5	4
Mvmt Flow	121	161	275	179	341	507

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1553	364	0	0	454	0
Stage 1	364	-	-	-	-	-
Stage 2	1189	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.15	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.245	-
Pot Cap-1 Maneuver	126	685	-	-	1091	-
Stage 1	707	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 87	685	-	-	1091	-
Mov Cap-2 Maneuver	~ 87	-	-	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	201	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s$	354.9	0	3.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	173	1091	-
HCM Lane V/C Ratio	-	-	1.628	0.312	-
HCM Control Delay (s)	-	-	$ 354.9	9.8	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	19.1	1.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	67	275	113	150	350
Future Vol, veh/h	30	67	275	113	150	350
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	0	0	3	1	0	2
Mvmt Flow	50	112	458	188	250	583

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1636	553	0	0	647	0
Stage 1	553	-	-	-	-	-
Stage 2	1083	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	112	537	-	-	948	-
Stage 1	580	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	82	537	-	-	948	-
Mov Cap-2 Maneuver	82	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	242	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	40.8	0	3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	82	537	948	-
HCM Lane V/C Ratio	-	-	0.61	0.208	0.264	-
HCM Control Delay (s)	-	-	101.7	13.5	10.2	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	2.8	0.8	1.1	-

Intersection	
Int Delay, s/veh	82.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	127	0	103	3	285	129	109	267	4
Future Vol, veh/h	0	0	3	127	0	103	3	285	129	109	267	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	2	0
Mvmt Flow	0	0	4	187	0	151	4	419	190	160	393	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1315	1334	396	1241	1242	514	399	0	0	609	0	0
Stage 1	716	716	-	523	523	-	-	-	-	-	-	-
Stage 2	599	618	-	718	719	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	136	155	658	~ 153	176	564	1171	-	-	979	-	-
Stage 1	424	437	-	541	534	-	-	-	-	-	-	-
Stage 2	492	484	-	423	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	129	658	~ 133	147	564	1171	-	-	979	-	-
Mov Cap-2 Maneuver	87	129	-	~ 133	147	-	-	-	-	-	-	-
Stage 1	423	366	-	539	532	-	-	-	-	-	-	-
Stage 2	359	482	-	351	365	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	$ 365.5	0.1	2.7
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1171	-	-	658	202	979	-	-
HCM Lane V/C Ratio	0.004	-	-	0.007	1.674	0.164	-	-
HCM Control Delay (s)	8.1	-	-	10.5	$ 365.5	9.4	-	-
HCM Lane LOS	A	-	-	B	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	22.6	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	9.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	161	60	357	304	111	286
Future Vol, veh/h	161	60	357	304	111	286
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	3	1	1	2
Mvmt Flow	218	81	482	411	150	386

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1374	688	0	0	893	0
Stage 1	688	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	~ 162	450	-	-	764	-
Stage 1	503	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 130	450	-	-	764	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	405	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	48.5	0	3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	263	450	764	-
HCM Lane V/C Ratio	-	-	0.827	0.18	0.196	-
HCM Control Delay (s)	-	-	61.1	14.8	10.9	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	6.6	0.7	0.7	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	40	57	642	467	0
Future Vol, veh/h	1	40	57	642	467	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	19	9	3	3	0
Mvmt Flow	1	54	77	868	631	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1653	631	631	0	-	0
Stage 1	631	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Critical Hdwy	6.4	6.39	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.471	2.281	-	-	-
Pot Cap-1 Maneuver	109	452	919	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	350	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	100	452	919	-	-	-
Mov Cap-2 Maneuver	225	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	321	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	919	-	441	-	-
HCM Lane V/C Ratio	0.084	-	0.126	-	-
HCM Control Delay (s)	9.3	-	14.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.4	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	190	1	1	15	142	752	5	22	639	20
Future Vol, veh/h	0	0	190	1	1	15	142	752	5	22	639	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	7	3	4	0	0	6	20
Mvmt Flow	0	0	200	1	1	16	149	792	5	23	673	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	673	1812	1812	794	673	0	0	797	0	0
Stage 1	-	-	-	1093	1093	-	-	-	-	-	-	-
Stage 2	-	-	-	719	719	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.1	6.5	6.27	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.5	4	3.363	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	455	61	79	380	913	-	-	834	-	-
Stage 1	0	0	-	262	293	-	-	-	-	-	-	-
Stage 2	0	0	-	423	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	455	29	64	380	913	-	-	834	-	-
Mov Cap-2 Maneuver	-	-	-	29	64	-	-	-	-	-	-	-
Stage 1	-	-	-	219	245	-	-	-	-	-	-	-
Stage 2	-	-	-	231	424	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19	25.9	1.5	0.3
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	913	-	-	455	190	834	-	-
HCM Lane V/C Ratio	0.164	-	-	0.44	0.094	0.028	-	-
HCM Control Delay (s)	9.7	-	-	19	25.9	9.4	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	2.2	0.3	0.1	-	-

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	239	1	3	223	5	5
Future Vol, veh/h	239	1	3	223	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	1	3	242	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	261	0	509	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	249	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1303	-	524	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1303	-	523	779
Mov Cap-2 Maneuver	-	-	-	-	598	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	677	-	-	1303	-
HCM Lane V/C Ratio	0.016	-	-	0.003	-
HCM Control Delay (s)	10.4	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	122	419	154	105	49	358	419	184	48	363	87
Future Volume (veh/h)	63	122	419	154	105	49	358	419	184	48	363	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1845	1827	1814	1900	1759	1845	1845	1863	1823	1900
Adj Flow Rate, veh/h	71	137	471	173	118	55	402	471	207	54	408	98
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	4	3	4	6	6	8	3	3	2	5	5
Cap, veh/h	460	488	409	243	163	76	407	715	599	69	491	117
Arrive On Green	0.27	0.27	0.27	0.14	0.14	0.14	0.24	0.39	0.39	0.04	0.18	0.18
Sat Flow, veh/h	1723	1827	1534	1740	1164	543	1675	1845	1546	1774	2746	651
Grp Volume(v), veh/h	71	137	471	173	0	173	402	471	207	54	255	251
Grp Sat Flow(s),veh/h/ln	1723	1827	1534	1740	0	1707	1675	1845	1546	1774	1732	1666
Q Serve(g_s), s	3.3	6.2	28.0	10.0	0.0	10.2	25.1	22.0	9.9	3.2	14.9	15.3
Cycle Q Clear(g_c), s	3.3	6.2	28.0	10.0	0.0	10.2	25.1	22.0	9.9	3.2	14.9	15.3
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	460	488	409	243	0	238	407	715	599	69	310	298
V/C Ratio(X)	0.15	0.28	1.15	0.71	0.00	0.73	0.99	0.66	0.35	0.78	0.82	0.84
Avail Cap(c_a), veh/h	460	488	409	464	0	456	407	715	599	101	338	325
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	30.5	38.5	43.1	0.0	43.2	39.6	26.4	22.7	50.0	41.5	41.6
Incr Delay (d2), s/veh	0.1	0.1	92.4	1.5	0.0	1.6	41.1	1.8	0.1	11.5	12.9	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	3.2	22.3	4.9	0.0	4.9	16.3	11.6	4.3	1.8	8.2	8.3
LnGrp Delay(d),s/veh	29.5	30.6	130.9	44.6	0.0	44.8	80.7	28.2	22.8	61.5	54.4	56.8
LnGrp LOS	C	C	F	D		D	F	C	C	E	D	E
Approach Vol, veh/h		679			346			1080			560	
Approach Delay, s/veh		100.0			44.7			46.7			56.2	
Approach LOS		F			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	46.2		32.0	30.0	24.3		18.7
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	6.0	40.5		28.0	25.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	5.2	24.0		30.0	27.1	17.3		12.2
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	1.3		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	62.0
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	27	16	71	14	450	22	669	80	388	706	12
Future Volume (veh/h)	11	27	16	71	14	450	22	669	80	388	706	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1839	1845	1900	1845	1827	1863	1863	1900
Adj Flow Rate, veh/h	12	29	17	76	15	479	23	712	85	413	751	13
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	3	0	3	4	2	2	2
Cap, veh/h	90	196	98	320	57	720	28	745	621	446	1168	20
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.02	0.40	0.40	0.25	0.64	0.64
Sat Flow, veh/h	195	939	470	1172	270	1560	1810	1845	1538	1774	1825	32
Grp Volume(v), veh/h	58	0	0	91	0	479	23	712	85	413	0	764
Grp Sat Flow(s),veh/h/ln	1604	0	0	1442	0	1560	1810	1845	1538	1774	0	1857
Q Serve(g_s), s	0.0	0.0	0.0	1.9	0.0	18.5	1.1	33.1	3.1	20.1	0.0	22.3
Cycle Q Clear(g_c), s	2.3	0.0	0.0	4.2	0.0	18.5	1.1	33.1	3.1	20.1	0.0	22.3
Prop In Lane	0.21		0.29	0.84		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	385	0	0	377	0	720	28	745	621	446	0	1188
V/C Ratio(X)	0.15	0.00	0.00	0.24	0.00	0.66	0.83	0.96	0.14	0.93	0.00	0.64
Avail Cap(c_a), veh/h	385	0	0	377	0	720	113	762	635	462	0	1188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	0.0	29.2	0.0	18.6	43.4	25.6	16.6	32.3	0.0	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	2.3	20.6	22.2	0.1	24.3	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	1.9	0.0	9.5	0.7	21.4	1.3	12.8	0.0	11.6
LnGrp Delay(d),s/veh	28.7	0.0	0.0	29.5	0.0	20.9	64.0	47.8	16.7	56.6	0.0	10.9
LnGrp LOS	C			C		C	E	D	B	E		B
Approach Vol, veh/h		58			570			820			1177	
Approach Delay, s/veh		28.7			22.3			45.0			26.9	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.2	39.7		22.5	5.3	60.6		22.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	23.0	36.5		18.5	5.5	54.0		18.5
Max Q Clear Time (g_c+I1), s	22.1	35.1		4.3	3.1	24.3		20.5
Green Ext Time (p_c), s	0.1	0.6		2.4	0.0	13.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Future Volume (veh/h)	59	49	76	105	35	60	105	444	126	46	191	333
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1869	1900	1881	1876	1900	1827	1853	1900	1900	1845	1863
Adj Flow Rate, veh/h	63	52	81	112	37	64	112	472	134	49	203	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	0	0	4	3	3	0	3	2
Cap, veh/h	136	112	221	250	86	149	158	812	229	96	483	414
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.09	0.30	0.30	0.05	0.26	0.00
Sat Flow, veh/h	997	823	1615	1792	618	1069	1740	2713	765	1810	1845	1583
Grp Volume(v), veh/h	115	0	81	112	0	101	112	305	301	49	203	0
Grp Sat Flow(s),veh/h/ln	1819	0	1615	1792	0	1688	1740	1760	1718	1810	1845	1583
Q Serve(g_s), s	2.2	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Cycle Q Clear(g_c), s	2.2	0.0	1.8	2.2	0.0	2.1	2.4	5.7	5.7	1.0	3.5	0.0
Prop In Lane	0.55		1.00	1.00		0.63	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	249	0	221	250	0	236	158	527	514	96	483	414
V/C Ratio(X)	0.46	0.00	0.37	0.45	0.00	0.43	0.71	0.58	0.59	0.51	0.42	0.00
Avail Cap(c_a), veh/h	1204	0	1069	856	0	806	881	1590	1552	329	1068	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.3	0.0	15.1	15.2	0.0	15.2	17.0	11.4	11.5	17.8	11.8	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.4	0.5	0.0	0.5	2.2	0.5	0.6	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.8	1.1	0.0	1.0	1.2	2.8	2.8	0.5	1.8	0.0
LnGrp Delay(d),s/veh	15.8	0.0	15.5	15.7	0.0	15.6	19.2	12.0	12.0	19.3	12.1	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		196			213			718			252	
Approach Delay, s/veh		15.7			15.6			13.1			13.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	15.2		8.8	6.5	13.8		9.5
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	7.0	34.8		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	3.0	7.7		4.2	4.4	5.5		4.2
Green Ext Time (p_c), s	0.0	3.8		0.4	0.1	3.4		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	30.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	122	426	249	88	123	249
Future Vol, veh/h	122	426	249	88	123	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	3	3	2	4	1
Mvmt Flow	131	458	268	95	132	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	800	268	0	0	268	0
Stage 1	268	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.41	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	356	768	-	-	1284	-
Stage 1	779	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	313	768	-	-	1284	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.2	0	2.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	580	1284	-
HCM Lane V/C Ratio	-	-	1.016	0.103	-
HCM Control Delay (s)	-	-	68.2	8.1	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	15.5	0.3	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	188	46	55	215	61	84
Future Vol, veh/h	188	46	55	215	61	84
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	6	5	4
Mvmt Flow	204	50	60	234	66	91

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	582	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	353	-
Critical Hdwy	-	-	4.12	-	6.45	6.24
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.336
Pot Cap-1 Maneuver	-	-	1311	-	470	805
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	445	805
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	668	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	601	-	-	1311	-
HCM Lane V/C Ratio	0.262	-	-	0.046	-
HCM Control Delay (s)	13.1	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	282	182	488	303	44	161	1142	457	23	770	161
Future Volume (veh/h)	189	282	182	488	303	44	161	1142	457	23	770	161
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1827	1845	1845	1863	1810	1810	1881	1845	1743	1863	1810
Adj Flow Rate, veh/h	212	317	204	548	340	49	181	1283	513	26	865	181
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	4	3	3	2	5	5	1	3	9	2	5
Cap, veh/h	246	412	354	560	470	383	182	1359	854	35	1045	665
Arrive On Green	0.14	0.23	0.23	0.16	0.25	0.25	0.11	0.38	0.38	0.02	0.30	0.30
Sat Flow, veh/h	1792	1827	1568	3408	1863	1518	1723	3574	1568	1660	3539	1538
Grp Volume(v), veh/h	212	317	204	548	340	49	181	1283	513	26	865	181
Grp Sat Flow(s),veh/h/ln	1792	1827	1568	1704	1863	1518	1723	1787	1568	1660	1770	1538
Q Serve(g_s), s	11.1	15.5	11.1	15.3	16.0	2.4	10.0	33.2	21.2	1.5	21.8	7.2
Cycle Q Clear(g_c), s	11.1	15.5	11.1	15.3	16.0	2.4	10.0	33.2	21.2	1.5	21.8	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	412	354	560	470	383	182	1359	854	35	1045	665
V/C Ratio(X)	0.86	0.77	0.58	0.98	0.72	0.13	0.99	0.94	0.60	0.75	0.83	0.27
Avail Cap(c_a), veh/h	272	459	394	560	491	400	182	1359	854	87	1118	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	34.7	33.0	39.8	32.7	27.6	42.7	28.6	14.7	46.6	31.4	17.4
Incr Delay (d2), s/veh	22.2	9.0	3.3	32.6	6.3	0.3	64.9	13.6	1.8	27.2	5.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	8.9	5.1	9.7	9.0	1.0	8.0	18.8	9.5	0.9	11.4	3.2
LnGrp Delay(d),s/veh	62.6	43.7	36.3	72.4	39.0	27.9	107.6	42.3	16.5	73.8	37.2	17.9
LnGrp LOS	E	D	D	E	D	C	F	D	B	E	D	B
Approach Vol, veh/h		733			937			1977			1072	
Approach Delay, s/veh		47.1			57.9			41.6			34.8	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	41.8	20.2	27.1	14.6	33.7	17.6	29.6
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	35.3	15.7	24.0	10.1	30.2	14.5	25.2
Max Q Clear Time (g_c+I1), s	3.5	35.2	17.3	17.5	12.0	23.8	13.1	18.0
Green Ext Time (p_c), s	0.0	0.1	0.0	4.0	0.0	4.5	0.1	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
9: Sierra College Blvd & I-80 WB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	0	307	556	137	480	418	1639	392	0	2008	209
Future Volume (veh/h)	200	0	307	556	137	480	418	1639	392	0	2008	209
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1832	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	213	0	327	591	420	328	445	1744	417	0	2136	222
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	174	0	0	1305	444	372	338	2793	878	0	1637	535
Arrive On Green	0.10	0.00	0.00	0.37	0.24	0.24	0.38	1.00	1.00	0.00	0.33	0.33
Sat Flow, veh/h	1810	213		3514	1832	1538	1792	5036	1583	0	5055	1599
Grp Volume(v), veh/h	213	209.8		591	420	328	445	1744	417	0	2136	222
Grp Sat Flow(s),veh/h/ln	1810	F		1757	1832	1538	1792	1679	1583	0	1631	1599
Q Serve(g_s), s	14.4			19.1	33.8	30.8	28.3	0.0	0.0	0.0	50.2	16.1
Cycle Q Clear(g_c), s	14.4			19.1	33.8	30.8	28.3	0.0	0.0	0.0	50.2	16.1
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	174			1305	444	372	338	2793	878	0	1637	535
V/C Ratio(X)	1.23			0.45	0.95	0.88	1.32	0.62	0.47	0.00	1.30	0.42
Avail Cap(c_a), veh/h	174			1368	476	400	338	2793	878	0	1637	535
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.15	0.15
Uniform Delay (d), s/veh	67.8			35.6	55.9	54.8	46.7	0.0	0.0	0.0	49.9	38.6
Incr Delay (d2), s/veh	142.0			0.1	26.7	17.9	161.9	1.1	1.8	0.0	137.9	0.4
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0			9.3	20.4	15.0	29.1	0.3	0.4	0.0	43.5	7.1
LnGrp Delay(d),s/veh	209.8			35.7	82.6	72.7	208.6	1.1	1.8	0.0	187.8	38.9
LnGrp LOS	F			D	F	E	F	A	A		F	D
Approach Vol, veh/h					1339			2606			2358	
Approach Delay, s/veh					59.5			36.6			173.8	
Approach LOS					E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		89.4	60.6		33.0	56.4	19.0	41.6
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		80.5	58.4		* 28	47.5	14.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	21.1		30.3	52.2	16.4	35.8
Green Ext Time (p_c), s		34.5	0.4		0.0	0.0	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	96.6
HCM 2010 LOS	F

Notes

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	199	0	124	0	1638	188	115	1325	0
Future Volume (vph)	0	0	142	199	0	124	0	1638	188	115	1325	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1583	1770		1553		5085	1615	1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1583	1770		1553		5085	1615	1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	207	0	129	0	1706	196	120	1380	0
RTOR Reduction (vph)	0	0	142	0	0	93	0	0	84	0	0	0
Lane Group Flow (vph)	0	0	6	207	0	36	0	1706	112	120	1380	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			2.3	9.4		16.2		24.2	33.6	4.9	33.1	
Effective Green, g (s)			2.3	9.4		16.2		24.2	33.6	4.9	33.1	
Actuated g/C Ratio			0.04	0.16		0.28		0.41	0.57	0.08	0.56	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			61	282		427		2092	922	148	1992	
v/s Ratio Prot				c0.12				c0.34	0.02	0.07	c0.39	
v/s Ratio Perm			0.00			c0.02			0.05			
v/c Ratio			0.09	0.73		0.08		0.82	0.12	0.81	0.69	
Uniform Delay, d1			27.2	23.5		15.8		15.3	5.8	26.5	9.2	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.7	9.5		0.1		2.7	0.1	26.2	1.1	
Delay (s)			27.9	33.0		15.9		18.0	5.9	52.7	10.4	
Level of Service			C	C		B		B	A	D	B	
Approach Delay (s)		27.9			26.4			16.8			13.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	26	368	107	24	33	358	1851	69	61	1752	126
Future Volume (veh/h)	197	26	368	107	24	33	358	1851	69	61	1752	126
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1863	1863	1863	1881
Adj Flow Rate, veh/h	210	28	391	114	26	35	381	1969	73	65	1864	134
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	240	303	454	140	207	172	412	2039	912	84	1360	606
Arrive On Green	0.13	0.17	0.17	0.08	0.11	0.11	0.24	0.58	0.58	0.05	0.38	0.38
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	3539	1582	1774	3539	1577
Grp Volume(v), veh/h	210	28	391	114	26	35	381	1969	73	65	1864	134
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1770	1582	1774	1770	1577
Q Serve(g_s), s	14.8	1.7	18.1	8.3	1.7	2.7	28.1	69.2	2.7	4.7	50.0	7.4
Cycle Q Clear(g_c), s	14.8	1.7	18.1	8.3	1.7	2.7	28.1	69.2	2.7	4.7	50.0	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	303	454	140	207	172	412	2039	912	84	1360	606
V/C Ratio(X)	0.87	0.09	0.86	0.81	0.13	0.20	0.92	0.97	0.08	0.77	1.37	0.22
Avail Cap(c_a), veh/h	417	421	630	405	421	351	596	2039	912	273	1360	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.4	46.0	52.8	58.9	51.9	52.4	48.3	26.3	12.3	61.3	40.1	27.0
Incr Delay (d2), s/veh	9.8	0.1	8.8	10.7	0.3	0.6	15.7	13.0	0.1	14.0	171.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.9	7.4	4.5	0.9	1.2	15.1	37.3	1.2	2.6	56.8	3.3
LnGrp Delay(d),s/veh	65.2	46.1	61.6	69.6	52.2	53.0	64.1	39.3	12.3	75.3	211.7	27.4
LnGrp LOS	E	D	E	E	D	D	E	D	B	E	F	C
Approach Vol, veh/h		629			175			2423			2063	
Approach Delay, s/veh		62.1			63.7			42.4			195.5	
Approach LOS		E			E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	80.0	14.4	25.6	35.2	55.0	21.3	18.7
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	6.7	71.2	10.3	20.1	30.1	52.0	16.8	4.7
Green Ext Time (p_c), s	0.1	0.0	0.3	1.5	1.1	0.0	0.5	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	105.1
HCM 2010 LOS	F

HCM 2010 Signalized Intersection Summary
10: Sierra College Blvd & I-80 EB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	728	276	151	199	0	464	0	1852	177	393	1237	621
Future Volume (veh/h)	728	276	151	199	0	464	0	1852	177	393	1237	621
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1881	0	1881	0	1827	1900	1881	1845	1881
Adj Flow Rate, veh/h	766	291	159	209	0	488	0	1949	186	414	1302	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	1	0	1	0	4	0	1	3	1
Cap, veh/h	912	422	185	210	0	0	0	2010	516	1049	2324	1060
Arrive On Green	0.27	0.12	0.12	0.12	0.00	0.00	0.00	0.32	0.32	0.60	1.00	0.00
Sat Flow, veh/h	3442	3610	1583	1792	209		0	6540	1615	3476	3505	1599
Grp Volume(v), veh/h	766	291	159	209	126.4		0	1949	186	414	1302	0
Grp Sat Flow(s),veh/h/ln	1721	1805	1583	1792	F		0	1571	1615	1738	1752	1599
Q Serve(g_s), s	31.6	11.6	14.8	17.5			0.0	45.9	9.6	9.3	0.0	0.0
Cycle Q Clear(g_c), s	31.6	11.6	14.8	17.5			0.0	45.9	9.6	9.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	912	422	185	210			0	2010	516	1049	2324	1060
V/C Ratio(X)	0.84	0.69	0.86	0.99			0.00	0.97	0.36	0.39	0.56	0.00
Avail Cap(c_a), veh/h	912	1011	443	210			0	2011	517	1049	2324	1060
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.84	0.84	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.1	63.6	65.0	66.1			0.0	50.3	20.4	22.6	0.0	0.0
Incr Delay (d2), s/veh	6.9	0.8	4.4	60.3			0.0	12.5	1.6	0.1	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.9	5.9	6.7	12.2			0.0	21.6	4.5	4.4	0.3	0.0
LnGrp Delay(d),s/veh	59.0	64.4	69.4	126.4			0.0	62.8	22.1	22.7	1.0	0.0
LnGrp LOS	E	E	E	F				E	C	C	A	
Approach Vol, veh/h		1216						2135			1716	
Approach Delay, s/veh		61.7						59.3			6.2	
Approach LOS		E						E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	51.5	54.2	22.2	22.2		105.6	44.4	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	22.4	* 48	17.6	42.0		75.0	37.9	
Max Q Clear Time (g_c+I1), s	11.3	47.9	19.5	16.8		2.0	33.6	
Green Ext Time (p_c), s	3.7	0.1	0.0	0.8		4.7	1.1	

Intersection Summary	
HCM 2010 Ctrl Delay	45.2
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	0	51	75	0	156	48	1778	194	0	1390	90
Future Volume (veh/h)	97	0	51	75	0	156	48	1778	194	0	1390	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1900	1881	1863	1863	1900	0	1863	1863
Adj Flow Rate, veh/h	105	0	55	82	0	170	52	1933	211	0	1511	98
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	1	2	2	2	0	2	2
Cap, veh/h	143	0	128	232	0	205	68	3877	423	0	2028	907
Arrive On Green	0.08	0.00	0.08	0.13	0.00	0.13	0.04	0.66	0.66	0.00	0.57	0.57
Sat Flow, veh/h	1774	0	1583	1810	0	1599	1774	5910	645	0	3632	1583
Grp Volume(v), veh/h	105	0	55	82	0	170	52	1572	572	0	1511	98
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1810	0	1599	1774	1602	1748	0	1770	1583
Q Serve(g_s), s	5.8	0.0	3.3	4.1	0.0	10.4	2.9	16.7	16.7	0.0	31.8	2.8
Cycle Q Clear(g_c), s	5.8	0.0	3.3	4.1	0.0	10.4	2.9	16.7	16.7	0.0	31.8	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	0.00		1.00
Lane Grp Cap(c), veh/h	143	0	128	232	0	205	68	3153	1147	0	2028	907
V/C Ratio(X)	0.73	0.00	0.43	0.35	0.00	0.83	0.77	0.50	0.50	0.00	0.75	0.11
Avail Cap(c_a), veh/h	319	0	285	326	0	288	89	3153	1147	0	2028	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.68	0.68	0.68	0.00	0.75	0.75
Uniform Delay (d), s/veh	44.9	0.0	43.8	39.8	0.0	42.5	47.6	8.8	8.8	0.0	15.9	9.7
Incr Delay (d2), s/veh	7.1	0.0	2.3	0.9	0.0	13.0	18.0	0.4	1.1	0.0	1.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	1.5	2.1	0.0	5.3	1.8	7.4	8.3	0.0	15.9	1.3
LnGrp Delay(d),s/veh	52.0	0.0	46.1	40.7	0.0	55.5	65.6	9.2	9.9	0.0	17.8	9.9
LnGrp LOS	D		D	D		E	E	A	A		B	A
Approach Vol, veh/h		160			252			2196			1609	
Approach Delay, s/veh		50.0			50.7			10.7			17.4	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		70.1		12.6	8.3	61.8		17.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		50.5		18.0	5.0	41.0		18.0
Max Q Clear Time (g_c+I1), s		18.7		7.8	4.9	33.8		12.4
Green Ext Time (p_c), s		29.9		0.4	0.0	7.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	1	107	0	70	2	1945	85	80	1437	1
Future Volume (veh/h)	5	0	1	107	0	70	2	1945	85	80	1437	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1776	1900	1900	1900	1863	1863	1696	1881	1900
Adj Flow Rate, veh/h	5	0	1	116	0	76	2	2114	92	87	1562	1
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	7	0	0	0	2	2	12	1	0
Cap, veh/h	12	0	8	206	116	98	5	2998	933	108	2336	1055
Arrive On Green	0.01	0.00	0.00	0.06	0.00	0.06	0.00	0.59	0.59	0.07	0.65	0.65
Sat Flow, veh/h	1810	0	1615	3281	1900	1615	1810	5085	1582	1616	3574	1614
Grp Volume(v), veh/h	5	0	1	116	0	76	2	2114	92	87	1562	1
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1640	1900	1615	1810	1695	1582	1616	1787	1614
Q Serve(g_s), s	0.2	0.0	0.0	2.5	0.0	3.3	0.1	20.9	1.8	3.8	19.3	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	2.5	0.0	3.3	0.1	20.9	1.8	3.8	19.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	12	0	8	206	116	98	5	2998	933	108	2336	1055
V/C Ratio(X)	0.42	0.00	0.13	0.56	0.00	0.77	0.41	0.71	0.10	0.81	0.67	0.00
Avail Cap(c_a), veh/h	126	0	712	384	927	788	126	3113	968	142	2336	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	0.0	35.5	32.6	0.0	33.2	35.7	10.3	6.4	33.0	7.6	4.3
Incr Delay (d2), s/veh	21.6	0.0	9.2	2.4	0.0	14.3	46.0	0.7	0.1	21.8	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	1.2	0.0	1.9	0.1	9.8	0.8	2.3	9.6	0.0
LnGrp Delay(d),s/veh	57.1	0.0	44.7	35.1	0.0	47.4	81.7	11.1	6.5	54.9	8.4	4.3
LnGrp LOS	E		D	D		D	F	B	A	D	A	A
Approach Vol, veh/h		6			192			2208			1650	
Approach Delay, s/veh		55.0			40.0			11.0			10.9	
Approach LOS		E			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.3	48.1	9.0	5.3	4.7	52.7	5.0	9.4
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	6.3	43.9	8.4	31.6	5.0	45.2	5.0	35.0
Max Q Clear Time (g_c+I1), s	5.8	22.9	4.5	2.0	2.1	21.3	2.2	5.3
Green Ext Time (p_c), s	0.0	19.3	0.1	0.3	0.0	23.4	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	119	74	26	1824	1432	67
Future Volume (veh/h)	119	74	26	1824	1432	67
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1864	1900
Adj Flow Rate, veh/h	125	78	27	1920	1507	71
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2
Cap, veh/h	310	143	56	2564	3043	143
Arrive On Green	0.09	0.09	0.03	0.72	0.61	0.61
Sat Flow, veh/h	3510	1615	1810	3632	5149	235
Grp Volume(v), veh/h	125	78	27	1920	1027	551
Grp Sat Flow(s),veh/h/ln	1755	1615	1810	1770	1697	1823
Q Serve(g_s), s	1.8	2.5	0.8	17.8	9.2	9.2
Cycle Q Clear(g_c), s	1.8	2.5	0.8	17.8	9.2	9.2
Prop In Lane	1.00	1.00	1.00			0.13
Lane Grp Cap(c), veh/h	310	143	56	2564	2073	1114
V/C Ratio(X)	0.40	0.55	0.48	0.75	0.50	0.50
Avail Cap(c_a), veh/h	1193	549	173	2685	2073	1114
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	23.8	26.0	4.5	5.9	5.9
Incr Delay (d2), s/veh	0.8	3.2	6.4	1.2	0.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.2	0.5	8.7	4.2	4.6
LnGrp Delay(d),s/veh	24.3	27.0	32.4	5.7	6.1	6.3
LnGrp LOS	C	C	C	A	A	A
Approach Vol, veh/h	203			1947	1578	
Approach Delay, s/veh	25.3			6.1	6.2	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.3	6.2	39.0				45.1
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	5.2	31.6				41.3
Max Q Clear Time (g_c+I1), s		4.5	2.8	11.2				19.8
Green Ext Time (p_c), s		0.5	0.0	19.9				19.6

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	412	411	70	340	224	406	1336	74	214	1014	287
Future Volume (veh/h)	386	412	411	70	340	224	406	1336	74	214	1014	287
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1845	1900	1900	1810	1900	1863	1863	1900	1863	1863	1845
Adj Flow Rate, veh/h	415	443	442	75	366	241	437	1437	80	230	1090	309
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	0	0	5	5	2	2	2	2	2	3
Cap, veh/h	372	1036	473	95	278	180	515	1338	74	210	1839	556
Arrive On Green	0.21	0.30	0.30	0.05	0.14	0.14	0.15	0.39	0.39	0.12	0.36	0.36
Sat Flow, veh/h	1792	3505	1599	1810	1975	1275	3442	3408	189	1774	5085	1537
Grp Volume(v), veh/h	415	443	442	75	318	289	437	744	773	230	1090	309
Grp Sat Flow(s),veh/h/ln	1792	1752	1599	1810	1719	1531	1721	1770	1828	1774	1695	1537
Q Serve(g_s), s	28.0	13.8	36.3	5.5	19.0	19.0	16.7	53.0	53.0	16.0	23.5	21.7
Cycle Q Clear(g_c), s	28.0	13.8	36.3	5.5	19.0	19.0	16.7	53.0	53.0	16.0	23.5	21.7
Prop In Lane	1.00		1.00	1.00		0.83	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	372	1036	473	95	242	215	515	695	718	210	1839	556
V/C Ratio(X)	1.12	0.43	0.94	0.79	1.31	1.34	0.85	1.07	1.08	1.09	0.59	0.56
Avail Cap(c_a), veh/h	372	1036	473	121	242	215	612	695	718	210	1839	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	38.3	46.3	63.2	58.0	58.0	55.9	41.0	41.0	59.5	35.0	34.4
Incr Delay (d2), s/veh	82.2	1.0	27.5	23.1	167.3	181.9	11.6	54.7	56.3	89.4	0.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.3	6.8	19.6	3.4	20.2	18.9	8.8	36.4	37.9	13.0	11.1	9.4
LnGrp Delay(d),s/veh	135.7	39.4	73.8	86.3	225.3	239.9	67.6	95.7	97.3	148.9	35.6	36.0
LnGrp LOS	F	D	E	F	F	F	E	F	F	F	D	D
Approach Vol, veh/h		1300			682			1954			1629	
Approach Delay, s/veh		81.8			216.2			90.1			51.7	
Approach LOS		F			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	58.0	11.1	45.9	24.2	53.8	32.0	25.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	16.0	53.0	9.0	38.0	24.0	45.0	28.0	19.0
Max Q Clear Time (g_c+I1), s	18.0	55.0	7.5	38.3	18.7	25.5	30.0	21.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	1.5	19.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	92.4
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	34	181	102	34	46	152	652	119	41	540	36
Future Volume (veh/h)	64	34	181	102	34	46	152	652	119	41	540	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1737	1845	1900	1743	1792	1681	1847	1900	1900	1827	1624
Adj Flow Rate, veh/h	70	37	199	112	37	51	167	716	131	45	593	40
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	12	12	3	9	9	6	13	3	3	0	4	17
Cap, veh/h	68	21	463	72	13	450	198	769	141	69	768	567
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.12	0.51	0.51	0.04	0.42	0.42
Sat Flow, veh/h	0	71	1565	0	44	1521	1601	1520	278	1810	1827	1350
Grp Volume(v), veh/h	107	0	199	149	0	51	167	0	847	45	593	40
Grp Sat Flow(s),veh/h/ln	71	0	1565	44	0	1521	1601	0	1798	1810	1827	1350
Q Serve(g_s), s	0.0	0.0	9.0	0.0	0.0	2.1	8.9	0.0	38.5	2.1	24.4	1.5
Cycle Q Clear(g_c), s	25.9	0.0	9.0	25.9	0.0	2.1	8.9	0.0	38.5	2.1	24.4	1.5
Prop In Lane	0.65		1.00	0.75		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	89	0	463	85	0	450	198	0	910	69	768	567
V/C Ratio(X)	1.20	0.00	0.43	1.75	0.00	0.11	0.84	0.00	0.93	0.65	0.77	0.07
Avail Cap(c_a), veh/h	89	0	463	85	0	450	240	0	916	114	772	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	0.0	24.9	39.8	0.0	22.4	37.5	0.0	20.2	41.5	21.8	15.2
Incr Delay (d2), s/veh	159.5	0.0	0.7	380.6	0.0	0.1	20.5	0.0	16.4	11.6	6.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	3.9	11.0	0.0	0.9	5.1	0.0	23.0	1.3	13.5	0.6
LnGrp Delay(d),s/veh	197.3	0.0	25.6	420.4	0.0	22.6	58.0	0.0	36.5	53.2	27.9	15.3
LnGrp LOS	F		C	F		C	E		D	D	C	B
Approach Vol, veh/h		306			200			1014			678	
Approach Delay, s/veh		85.6			319.0			40.1			28.8	
Approach LOS		F			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	49.7		30.4	14.9	42.2		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.5	44.6		25.9	13.1	37.0		25.9
Max Q Clear Time (g_c+I1), s	4.1	40.5		27.9	10.9	26.4		27.9
Green Ext Time (p_c), s	0.0	3.8		0.0	0.1	9.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	68.3
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	141	22	812	160	380	43	821	742	205	740	37
Future Volume (veh/h)	42	141	22	812	160	380	43	821	742	205	740	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1836	1900	1881	1869	1900	1900	1845	1881	1900	1860	1900
Adj Flow Rate, veh/h	45	150	23	985	0	404	46	873	789	218	787	39
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	1	3	0	0	3	1	0	2	2
Cap, veh/h	146	255	38	1063	0	477	60	1279	582	206	1526	76
Arrive On Green	0.08	0.08	0.08	0.30	0.00	0.30	0.03	0.36	0.36	0.11	0.45	0.45
Sat Flow, veh/h	1740	3034	456	3583	0	1607	1810	3505	1596	1810	3423	170
Grp Volume(v), veh/h	45	85	88	985	0	404	46	873	789	218	406	420
Grp Sat Flow(s),veh/h/ln	1740	1744	1746	1792	0	1607	1810	1752	1596	1810	1767	1826
Q Serve(g_s), s	3.2	6.2	6.4	35.1	0.0	31.1	3.3	27.7	48.0	15.0	21.8	21.8
Cycle Q Clear(g_c), s	3.2	6.2	6.4	35.1	0.0	31.1	3.3	27.7	48.0	15.0	21.8	21.8
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	146	146	146	1063	0	477	60	1279	582	206	788	814
V/C Ratio(X)	0.31	0.58	0.60	0.93	0.00	0.85	0.77	0.68	1.35	1.06	0.52	0.52
Avail Cap(c_a), veh/h	370	371	372	1103	0	495	124	1279	582	206	788	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.7	58.0	58.1	44.9	0.0	43.5	63.1	35.3	41.8	58.3	26.2	26.2
Incr Delay (d2), s/veh	1.2	3.6	3.9	12.8	0.0	12.7	18.5	1.7	170.6	78.4	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	3.1	3.2	19.3	0.0	15.4	2.0	13.6	48.6	11.9	10.8	11.1
LnGrp Delay(d),s/veh	57.9	61.6	62.0	57.7	0.0	56.1	81.6	37.0	212.4	136.7	27.0	27.0
LnGrp LOS	E	E	E	E		E	F	D	F	F	C	C
Approach Vol, veh/h		218			1389			1708			1044	
Approach Delay, s/veh		61.0			57.3			119.2			49.9	
Approach LOS		E			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.0	53.0		16.0	8.3	63.7		43.5
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	15.0	48.0		28.0	9.0	54.0		40.5
Max Q Clear Time (g_c+I1), s	17.0	50.0		8.4	5.3	23.8		37.1
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	24.9		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	80.0
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	945	14	36	1168	523	49	19	11	531	19	289
Future Volume (veh/h)	268	945	14	36	1168	523	49	19	11	531	19	289
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1845	1881	1776	1900	1900	1900	1863	1865	1900
Adj Flow Rate, veh/h	279	984	15	38	1217	0	51	20	11	567	0	301
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	3	1	7	0	0	0	2	0	0
Cap, veh/h	291	1714	26	48	1221	516	124	78	43	847	0	384
Arrive On Green	0.16	0.48	0.48	0.03	0.34	0.00	0.07	0.07	0.07	0.24	0.00	0.24
Sat Flow, veh/h	1810	3604	55	1757	3574	1509	1810	1146	630	3548	0	1607
Grp Volume(v), veh/h	279	488	511	38	1217	0	51	0	31	567	0	301
Grp Sat Flow(s),veh/h/ln	1810	1787	1872	1757	1787	1509	1810	0	1776	1774	0	1607
Q Serve(g_s), s	15.7	20.2	20.2	2.2	34.8	0.0	2.8	0.0	1.7	14.8	0.0	18.0
Cycle Q Clear(g_c), s	15.7	20.2	20.2	2.2	34.8	0.0	2.8	0.0	1.7	14.8	0.0	18.0
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	291	850	890	48	1221	516	124	0	121	847	0	384
V/C Ratio(X)	0.96	0.57	0.57	0.80	1.00	0.00	0.41	0.00	0.26	0.67	0.00	0.78
Avail Cap(c_a), veh/h	291	850	890	115	1221	516	124	0	121	1108	0	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.6	19.4	19.4	49.6	33.7	0.0	45.8	0.0	45.3	35.3	0.0	36.5
Incr Delay (d2), s/veh	41.2	2.3	2.2	25.0	25.0	0.0	9.9	0.0	5.0	1.4	0.0	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	10.4	10.9	1.4	21.3	0.0	1.7	0.0	1.0	7.4	0.0	8.7
LnGrp Delay(d),s/veh	83.8	21.7	21.6	74.5	58.6	0.0	55.6	0.0	50.3	36.7	0.0	43.6
LnGrp LOS	F	C	C	E	E		E		D	D		D
Approach Vol, veh/h		1278			1255			82			868	
Approach Delay, s/veh		35.2			59.1			53.6			39.1	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	7.3	53.7		29.5	21.0	40.0
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	6.7	44.8		32.0	16.5	35.0
Max Q Clear Time (g_c+I1), s		4.8	4.2	22.2		20.0	17.7	36.8
Green Ext Time (p_c), s		0.0	0.0	21.7		4.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.2
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	978	529	577	1464	0	0	0	0	46	3	324
Future Volume (veh/h)	0	978	529	577	1464	0	0	0	0	46	3	324
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1863	1863	1827	0				1900	1863	1900
Adj Flow Rate, veh/h	0	1029	557	607	1541	0				48	3	341
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	2	4	0				0	0	0
Cap, veh/h	0	1022	451	596	2353	0				416	3	362
Arrive On Green	0.00	0.29	0.29	0.34	0.68	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	3668	1578	1774	3563	0				1810	14	1572
Grp Volume(v), veh/h	0	1029	557	607	1541	0				48	0	344
Grp Sat Flow(s),veh/h/ln	0	1787	1578	1774	1736	0				1810	0	1586
Q Serve(g_s), s	0.0	28.6	28.6	33.6	25.7	0.0				2.1	0.0	21.3
Cycle Q Clear(g_c), s	0.0	28.6	28.6	33.6	25.7	0.0				2.1	0.0	21.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1022	451	596	2353	0				416	0	365
V/C Ratio(X)	0.00	1.01	1.23	1.02	0.65	0.00				0.12	0.00	0.94
Avail Cap(c_a), veh/h	0	1022	451	596	2353	0				416	0	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.76	0.76	0.13	0.13	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.7	35.7	33.2	9.3	0.0				30.5	0.0	37.9
Incr Delay (d2), s/veh	0.0	26.1	119.3	18.3	0.2	0.0				0.0	0.0	32.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.8	27.4	19.4	12.3	0.0				1.1	0.0	12.6
LnGrp Delay(d),s/veh	0.0	61.8	155.0	51.5	9.5	0.0				30.5	0.0	70.2
LnGrp LOS		F	F	F	A					C		E
Approach Vol, veh/h		1586			2148						392	
Approach Delay, s/veh		94.6			21.4						65.4	
Approach LOS		F			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	39.2	33.7		27.1		72.9		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	33.6	28.6		23.0		67.8		
Max Q Clear Time (g_c+I1), s	35.6	30.6		23.3		27.7		
Green Ext Time (p_c), s	0.0	0.0		0.0		24.5		

Intersection Summary	
HCM 2010 Ctrl Delay	53.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	805	0	0	1437	101	604	4	580	0	0	0
Future Volume (veh/h)	219	805	0	0	1437	101	604	4	580	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1900	1810	1837	1863			
Adj Flow Rate, veh/h	238	875	0	0	1562	110	855	0	421			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	1	0	0	1	1	5	0	2			
Cap, veh/h	250	2329	0	0	1632	114	951	0	437			
Arrive On Green	0.14	0.65	0.00	0.00	0.48	0.48	0.28	0.00	0.28			
Sat Flow, veh/h	1774	3668	0	0	3483	237	3447	0	1583			
Grp Volume(v), veh/h	238	875	0	0	819	853	855	0	421			
Grp Sat Flow(s),veh/h/ln	1774	1787	0	0	1787	1839	1723	0	1583			
Q Serve(g_s), s	16.0	13.6	0.0	0.0	52.6	53.8	28.7	0.0	31.5			
Cycle Q Clear(g_c), s	16.0	13.6	0.0	0.0	52.6	53.8	28.7	0.0	31.5			
Prop In Lane	1.00		0.00	0.00		0.13	1.00		1.00			
Lane Grp Cap(c), veh/h	250	2329	0	0	861	886	951	0	437			
V/C Ratio(X)	0.95	0.38	0.00	0.00	0.95	0.96	0.90	0.00	0.96			
Avail Cap(c_a), veh/h	250	2329	0	0	861	886	951	0	437			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.17	0.17	0.00	0.00	0.72	0.72	1.00	0.00	1.00			
Uniform Delay (d), s/veh	51.2	9.6	0.0	0.0	29.8	30.1	41.8	0.0	42.9			
Incr Delay (d2), s/veh	13.5	0.1	0.0	0.0	16.7	18.1	11.6	0.0	33.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.7	6.7	0.0	0.0	29.7	31.7	15.2	0.0	17.9			
LnGrp Delay(d),s/veh	64.7	9.7	0.0	0.0	46.5	48.2	53.4	0.0	76.8			
LnGrp LOS	E	A			D	D	D		E			
Approach Vol, veh/h		1113			1672			1276				
Approach Delay, s/veh		21.5			47.4			61.1				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		82.8			20.4	62.4		37.2
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		78.2			16.9	57.8		33.1
Max Q Clear Time (g_c+I1), s		15.6			18.0	55.8		33.5
Green Ext Time (p_c), s		23.9			0.0	1.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	1257	116	22	1452	0	86	0	21	0	0	0
Future Volume (veh/h)	52	1257	116	22	1452	0	86	0	21	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1861	1900	1900	1863	0	1827	0	1810			
Adj Flow Rate, veh/h	57	1381	127	24	1596	0	95	0	23			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	0	4	0	5			
Cap, veh/h	111	2212	202	40	2256	0	136	0	120			
Arrive On Green	0.06	0.68	0.68	0.02	0.64	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3269	299	1810	3632	0	1740	0	1538			
Grp Volume(v), veh/h	57	744	764	24	1596	0	95	0	23			
Grp Sat Flow(s),veh/h/ln	1810	1768	1800	1810	1770	0	1740	0	1538			
Q Serve(g_s), s	1.8	14.2	14.4	0.8	18.0	0.0	3.2	0.0	0.8			
Cycle Q Clear(g_c), s	1.8	14.2	14.4	0.8	18.0	0.0	3.2	0.0	0.8			
Prop In Lane	1.00		0.17	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	111	1196	1218	40	2256	0	136	0	120			
V/C Ratio(X)	0.52	0.62	0.63	0.60	0.71	0.00	0.70	0.00	0.19			
Avail Cap(c_a), veh/h	180	1196	1218	165	2314	0	605	0	535			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.5	5.5	5.5	29.3	7.2	0.0	27.2	0.0	26.1			
Incr Delay (d2), s/veh	3.7	1.7	1.7	13.9	1.4	0.0	6.4	0.0	0.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.0	7.4	7.6	0.5	9.1	0.0	1.8	0.0	0.4			
LnGrp Delay(d),s/veh	31.2	7.1	7.2	43.2	8.7	0.0	33.6	0.0	26.8			
LnGrp LOS	C	A	A	D	A		C		C			
Approach Vol, veh/h		1565			1620			118				
Approach Delay, s/veh		8.1			9.2			32.3				
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	5.3	45.9			7.7	43.5		9.2
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.5	40.0			6.0	39.5		21.0
Max Q Clear Time (g_c+I1), s	2.8	16.4			3.8	20.0		5.2
Green Ext Time (p_c), s	0.0	23.4			0.0	18.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱	↰	↑↑↑	↑↑↳	
Traffic Vol, veh/h	0	20	5	1826	1665	2
Future Vol, veh/h	0	20	5	1826	1665	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1882	1716	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	859	1718	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	294	374	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	294	374	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	374	-	294	-	-
HCM Lane V/C Ratio	0.014	-	0.07	-	-
HCM Control Delay (s)	14.8	-	18.2	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	98	102	139	423	321	104
Future Vol, veh/h	98	102	139	423	321	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	111	151	460	349	113

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	937	231	462	0	-	0
Stage 1	405	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	263	771	1095	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	227	771	1095	-	-	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	477	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.1	2.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1095	-	227	771	-	-
HCM Lane V/C Ratio	0.138	-	0.469	0.144	-	-
HCM Control Delay (s)	8.8	-	34.1	10.5	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.5	-	2.3	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	936	139	22	935	39	122	3	27	68	10	349
Future Volume (veh/h)	179	936	139	22	935	39	122	3	27	68	10	349
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	195	1017	151	24	1016	42	133	3	29	0	0	466
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	238	1372	203	84	1286	53	185	16	152	0	269	458
Arrive On Green	0.13	0.44	0.44	0.05	0.37	0.37	0.10	0.10	0.10	0.00	0.00	0.14
Sat Flow, veh/h	1774	3093	459	1774	3464	143	1774	151	1455	0	1863	3167
Grp Volume(v), veh/h	195	581	587	24	519	539	133	0	32	0	0	466
Grp Sat Flow(s),veh/h/ln	1774	1770	1782	1774	1770	1837	1774	0	1606	0	1863	1583
Q Serve(g_s), s	7.4	18.8	18.9	0.9	18.0	18.0	5.0	0.0	1.3	0.0	0.0	10.0
Cycle Q Clear(g_c), s	7.4	18.8	18.9	0.9	18.0	18.0	5.0	0.0	1.3	0.0	0.0	10.0
Prop In Lane	1.00		0.26	1.00		0.08	1.00		0.91	0.00		1.00
Lane Grp Cap(c), veh/h	238	785	790	84	657	682	185	0	168	0	269	458
V/C Ratio(X)	0.82	0.74	0.74	0.29	0.79	0.79	0.72	0.00	0.19	0.00	0.00	1.02
Avail Cap(c_a), veh/h	282	845	851	128	691	718	770	0	697	0	269	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	29.1	15.9	16.0	31.8	19.3	19.3	30.0	0.0	28.3	0.0	0.0	29.6
Incr Delay (d2), s/veh	15.1	5.4	5.4	1.9	8.5	8.2	5.2	0.0	0.5	0.0	0.0	46.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	10.2	10.3	0.5	10.3	10.7	2.7	0.0	0.6	0.0	0.0	7.3
LnGrp Delay(d),s/veh	44.2	21.4	21.4	33.7	27.8	27.5	35.1	0.0	28.8	0.0	0.0	76.1
LnGrp LOS	D	C	C	C	C	C	D		C			F
Approach Vol, veh/h		1363			1082			165			466	
Approach Delay, s/veh		24.6			27.8			33.9			76.1	
Approach LOS		C			C			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.3	35.7		11.2	13.3	30.7		14.0
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 33		30.0	11.0	27.0		10.0
Max Q Clear Time (g_c+I1), s	2.9	20.9		7.0	9.4	20.0		12.0
Green Ext Time (p_c), s	1.8	9.8		0.5	0.1	5.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	402	161	1676	387	142	1543
Future Volume (veh/h)	402	161	1676	387	142	1543
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	437	175	1822	421	154	1677
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	626	288	2408	1038	194	2341
Arrive On Green	0.18	0.18	0.47	0.47	0.11	0.66
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	437	175	1822	421	154	1677
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	6.8	5.8	16.9	7.2	4.9	17.5
Cycle Q Clear(g_c), s	6.8	5.8	16.9	7.2	4.9	17.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	626	288	2408	1038	194	2341
V/C Ratio(X)	0.70	0.61	0.76	0.41	0.79	0.72
Avail Cap(c_a), veh/h	1078	496	2408	1038	232	2341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	21.6	12.4	4.6	24.9	6.3
Incr Delay (d2), s/veh	1.4	2.1	2.3	1.2	14.5	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.7	8.3	5.0	3.1	9.0
LnGrp Delay(d),s/veh	23.4	23.7	14.7	5.8	39.4	8.2
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	612		2243			1831
Approach Delay, s/veh	23.5		13.0			10.8
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.8	31.7				42.5		15.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	7.5	26.0				38.0		18.0
Max Q Clear Time (g_c+I1), s	6.9	18.9				19.5		8.8
Green Ext Time (p_c), s	0.0	7.0				17.9		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	296	7	0	323	0	3
Future Vol, veh/h	296	7	0	323	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	322	8	0	351	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	326
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	715
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	715
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	715	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	10.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Intersection Delay, s/veh	83.1
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	291	382	132	251	0	590	0	171	0	0	0
Future Vol, veh/h	1	291	382	132	251	0	590	0	171	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	7	3	7	6	0	5	0	4	0	0	0
Mvmt Flow	1	303	398	138	261	0	615	0	178	0	0	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	27.7	20.4	163.8	0
HCM LOS	D	C	F	-

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	590	171	292	382	132	251	0
LT Vol	590	0	1	0	132	0	0
Through Vol	0	0	291	0	0	251	0
RT Vol	0	171	0	382	0	0	0
Lane Flow Rate	615	178	304	398	138	261	0
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	1.38	0.335	0.628	0.758	0.321	0.573	0
Departure Headway (Hd)	8.081	6.768	8.278	7.673	9.284	8.745	9.97
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	455	531	438	474	391	416	0
Service Time	5.824	4.511	5.978	5.373	6.984	6.445	7.97
HCM Lane V/C Ratio	1.352	0.335	0.694	0.84	0.353	0.627	0
HCM Control Delay	207.5	12.9	23.9	30.6	16.3	22.5	13
HCM Lane LOS	F	B	C	D	C	C	N
HCM 95th-tile Q	29	1.5	4.2	6.5	1.4	3.5	0

Intersection	
Int Delay, s/veh	5.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	81	1123	18	106	669
Future Vol, veh/h	16	81	1123	18	106	669
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	2	0	2	5
Mvmt Flow	17	87	1208	19	114	719

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2164	1217	0	0	1227	0
Stage 1	1217	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	53	223	-	-	568	-
Stage 1	283	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	223	-	-	568	-
Mov Cap-2 Maneuver	42	-	-	-	-	-
Stage 1	283	-	-	-	-	-
Stage 2	304	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	97.7	0	1.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	130	568	-
HCM Lane V/C Ratio	-	-	0.802	0.201	-
HCM Control Delay (s)	-	-	97.7	12.9	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	4.9	0.7	-

Intersection	
Int Delay, s/veh	12

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	2	3	54	1	5	9	1132	88	2	685	1
Future Vol, veh/h	2	2	3	54	1	5	9	1132	88	2	685	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	1	0	5	0
Mvmt Flow	2	2	3	59	1	5	10	1230	96	2	745	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2000	1999	745	2001	2000	1230	746	0	0	1230	0	0
Stage 1	749	749	-	1250	1250	-	-	-	-	-	-	-
Stage 2	1251	1250	-	751	750	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	45	61	417	~ 45	61	219	871	-	-	574	-	-
Stage 1	407	422	-	214	247	-	-	-	-	-	-	-
Stage 2	213	247	-	406	422	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	43	60	417	~ 43	60	219	871	-	-	574	-	-
Mov Cap-2 Maneuver	43	60	-	~ 43	60	-	-	-	-	-	-	-
Stage 1	402	421	-	212	244	-	-	-	-	-	-	-
Stage 2	204	244	-	399	421	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	53.7	$ 388.4	0.1	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	871	-	-	50	417	43	219	574	-	-
HCM Lane V/C Ratio	0.011	-	-	0.087	0.008	1.39	0.025	0.004	-	-
HCM Control Delay (s)	9.2	-	-	83.7	13.7	$ 421.7	21.9	11.3	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	5.9	0.1	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	28	99	59	21	11	109	248	88	7	170	79
Future Vol, veh/h	87	28	99	59	21	11	109	248	88	7	170	79
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	5	0	5	0	5	0	4	2	1	0	5	4
Mvmt Flow	98	31	111	66	24	12	122	279	99	8	191	89
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	12.6	13.3	20.3	13.3
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	76%	0%	65%	100%	0%	0%
Vol Thru, %	0%	74%	24%	0%	23%	0%	100%	0%
Vol Right, %	0%	26%	0%	100%	12%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	336	115	99	91	7	170	79
LT Vol	109	0	87	0	59	7	0	0
Through Vol	0	248	28	0	21	0	170	0
RT Vol	0	88	0	99	11	0	0	79
Lane Flow Rate	122	378	129	111	102	8	191	89
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.249	0.691	0.285	0.209	0.23	0.017	0.389	0.163
Departure Headway (Hd)	7.324	6.593	7.947	6.765	8.112	7.75	7.326	6.594
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	491	547	452	531	443	462	491	544
Service Time	5.061	4.329	5.691	4.509	5.862	5.491	5.067	4.335
HCM Lane V/C Ratio	0.248	0.691	0.285	0.209	0.23	0.017	0.389	0.164
HCM Control Delay	12.5	22.8	13.8	11.3	13.3	10.6	14.7	10.6
HCM Lane LOS	B	C	B	B	B	B	B	B
HCM 95th-tile Q	1	5.3	1.2	0.8	0.9	0.1	1.8	0.6

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	28	464	335	1
Future Vol, veh/h	0	11	28	464	335	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	2	3	0
Mvmt Flow	0	13	33	540	390	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	995	390	391	0	-	0
Stage 1	390	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	274	663	1157	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	266	663	1157	-	-	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	533	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1157	-	663	-	-
HCM Lane V/C Ratio	0.028	-	0.019	-	-
HCM Control Delay (s)	8.2	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	8.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	193	299	59	133	213
Future Vol, veh/h	76	193	299	59	133	213
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	10	2	1	7	5	1
Mvmt Flow	86	219	340	67	151	242

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	917	373	0	0	407	0
Stage 1	373	-	-	-	-	-
Stage 2	544	-	-	-	-	-
Critical Hdwy	6.5	6.22	-	-	4.15	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.59	3.318	-	-	2.245	-
Pot Cap-1 Maneuver	292	673	-	-	1136	-
Stage 1	679	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	253	673	-	-	1136	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.3	0	3.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	458	1136	-
HCM Lane V/C Ratio	-	-	0.667	0.133	-
HCM Control Delay (s)	-	-	27.3	8.7	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	4.8	0.5	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	9	367	7	5	285
Future Vol, veh/h	40	9	367	7	5	285
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	43	10	390	7	5	303

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	708	394	0	0	398	0
Stage 1	394	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	404	659	-	-	1172	-
Stage 1	686	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	402	659	-	-	1172	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	742	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	402	659	1172	-
HCM Lane V/C Ratio	-	-	0.106	0.015	0.005	-
HCM Control Delay (s)	-	-	15	10.5	8.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	8	0	366	44	8	317	0
Future Vol, veh/h	0	0	0	38	0	8	0	366	44	8	317	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	3	0	0	0	2	0	0	3	0
Mvmt Flow	0	0	0	42	0	9	0	402	48	9	348	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	797	817	348	792	792	426	348	0	0	451	0	0
Stage 1	366	366	-	426	426	-	-	-	-	-	-	-
Stage 2	431	451	-	366	366	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	307	313	700	306	324	633	1222	-	-	1120	-	-
Stage 1	657	626	-	604	589	-	-	-	-	-	-	-
Stage 2	607	574	-	651	626	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	301	310	700	304	321	633	1222	-	-	1120	-	-
Mov Cap-2 Maneuver	301	310	-	304	321	-	-	-	-	-	-	-
Stage 1	657	621	-	604	589	-	-	-	-	-	-	-
Stage 2	599	574	-	646	621	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	17.7	0	0.2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1222	-	-	-	334	1120	-	-
HCM Lane V/C Ratio	-	-	-	-	0.151	0.008	-	-
HCM Control Delay (s)	0	-	-	0	17.7	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	42	368	160	38	317
Future Vol, veh/h	159	42	368	160	38	317
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	181	48	418	182	43	360

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	956	509	0	0	600	0
Stage 1	509	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	289	568	-	-	987	-
Stage 1	608	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	276	568	-	-	987	-
Mov Cap-2 Maneuver	406	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	621	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.9	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	406	568	987	-
HCM Lane V/C Ratio	-	-	0.445	0.084	0.044	-
HCM Control Delay (s)	-	-	20.8	11.9	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	39	33	498	459	3
Future Vol, veh/h	3	39	33	498	459	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	3	4	2	3	0
Mvmt Flow	3	44	37	560	516	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1151	517	519	0	-	0
Stage 1	517	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	221	556	1037	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	213	556	1037	-	-	-
Mov Cap-2 Maneuver	349	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	513	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1037	-	533	-	-
HCM Lane V/C Ratio	0.036	-	0.089	-	-
HCM Control Delay (s)	8.6	-	12.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	149	1	1	15	228	916	5	3	936	12
Future Vol, veh/h	0	0	149	1	1	15	228	916	5	3	936	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	7	4	3	0	33	1	0
Mvmt Flow	0	0	157	1	1	16	240	964	5	3	985	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	985	2439	2439	967	985	0	0	969	0	0
Stage 1	-	-	-	1447	1447	-	-	-	-	-	-	-
Stage 2	-	-	-	992	992	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.21	7.1	6.5	6.27	4.14	-	-	4.43	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.309	3.5	4	3.363	2.236	-	-	2.497	-	-
Pot Cap-1 Maneuver	0	0	302	22	32	302	693	-	-	601	-	-
Stage 1	0	0	-	165	198	-	-	-	-	-	-	-
Stage 2	0	0	-	299	326	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	302	8	21	302	693	-	-	601	-	-
Mov Cap-2 Maneuver	-	-	-	8	21	-	-	-	-	-	-	-
Stage 1	-	-	-	108	129	-	-	-	-	-	-	-
Stage 2	-	-	-	143	324	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.1	66.4	2.6	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	693	-	-	302	76	601	-	-
HCM Lane V/C Ratio	0.346	-	-	0.519	0.235	0.005	-	-
HCM Control Delay (s)	12.9	-	-	29.1	66.4	11	-	-
HCM Lane LOS	B	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	1.5	-	-	2.8	0.8	0	-	-

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	299	5	11	320	6	6
Future Vol, veh/h	299	5	11	320	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	325	5	12	348	7	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	330	0	700	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1229	-	405	713
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1229	-	401	713
Mov Cap-2 Maneuver	-	-	-	-	506	-
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	592	-	-	1229	-
HCM Lane V/C Ratio	0.022	-	-	0.01	-
HCM Control Delay (s)	11.2	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	49	288	205	71	22	280	337	167	22	357	41
Future Volume (veh/h)	55	49	288	205	71	22	280	337	167	22	357	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1667	1827	1881	1810	1900	1863	1863	1845	1900	1855	1900
Adj Flow Rate, veh/h	68	60	356	253	88	27	346	416	206	27	441	51
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	14	4	1	5	5	2	2	3	0	2	2
Cap, veh/h	437	434	396	321	237	73	306	647	536	33	594	68
Arrive On Green	0.26	0.26	0.26	0.18	0.18	0.18	0.17	0.35	0.35	0.02	0.19	0.19
Sat Flow, veh/h	1675	1667	1519	1792	1325	406	1774	1863	1543	1810	3167	364
Grp Volume(v), veh/h	68	60	356	253	0	115	346	416	206	27	244	248
Grp Sat Flow(s),veh/h/ln	1675	1667	1519	1792	0	1731	1774	1863	1543	1810	1762	1768
Q Serve(g_s), s	2.8	2.5	20.3	12.1	0.0	5.2	15.5	16.9	9.0	1.3	11.7	11.9
Cycle Q Clear(g_c), s	2.8	2.5	20.3	12.1	0.0	5.2	15.5	16.9	9.0	1.3	11.7	11.9
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	437	434	396	321	0	310	306	647	536	33	331	332
V/C Ratio(X)	0.16	0.14	0.90	0.79	0.00	0.37	1.13	0.64	0.38	0.82	0.74	0.75
Avail Cap(c_a), veh/h	522	519	473	558	0	540	306	695	575	60	402	403
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	25.5	32.1	35.3	0.0	32.4	37.2	24.6	22.1	44.0	34.4	34.5
Incr Delay (d2), s/veh	0.1	0.1	16.2	1.7	0.0	0.3	91.5	1.3	0.2	16.6	4.1	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.1	10.3	6.1	0.0	2.5	15.3	8.9	3.9	0.8	6.1	6.2
LnGrp Delay(d),s/veh	25.7	25.5	48.3	36.9	0.0	32.7	128.6	25.9	22.2	60.5	38.5	39.0
LnGrp LOS	C	C	D	D		C	F	C	C	E	D	D
Approach Vol, veh/h		484			368			968			519	
Approach Delay, s/veh		42.3			35.6			61.9			39.9	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	36.7		27.4	20.0	22.4		20.1
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	3.0	33.5		28.0	15.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	3.3	18.9		22.3	17.5	13.9		14.1
Green Ext Time (p_c), s	0.0	3.7		0.6	0.0	2.5		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	48.8
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	14	9	78	24	260	15	605	86	313	706	8
Future Volume (veh/h)	9	14	9	78	24	260	15	605	86	313	706	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1845	1900	1881	1845	1863	1845	1900
Adj Flow Rate, veh/h	10	16	10	89	27	295	17	688	98	356	802	9
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	3	0	1	3	2	3	3
Cap, veh/h	115	164	82	293	78	642	22	786	649	403	1152	13
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.01	0.42	0.42	0.23	0.63	0.63
Sat Flow, veh/h	269	894	447	1101	424	1559	1810	1881	1553	1774	1821	20
Grp Volume(v), veh/h	36	0	0	116	0	295	17	688	98	356	0	811
Grp Sat Flow(s),veh/h/ln	1610	0	0	1525	0	1559	1810	1881	1553	1774	0	1841
Q Serve(g_s), s	0.0	0.0	0.0	3.3	0.0	9.6	0.7	23.4	2.7	13.5	0.0	20.2
Cycle Q Clear(g_c), s	1.2	0.0	0.0	4.5	0.0	9.6	0.7	23.4	2.7	13.5	0.0	20.2
Prop In Lane	0.28		0.28	0.77		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	361	0	0	371	0	642	22	786	649	403	0	1165
V/C Ratio(X)	0.10	0.00	0.00	0.31	0.00	0.46	0.78	0.88	0.15	0.88	0.00	0.70
Avail Cap(c_a), veh/h	484	0	0	493	0	769	143	822	679	483	0	1165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	0.0	25.0	0.0	15.0	34.4	18.6	12.6	26.1	0.0	8.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.5	19.4	10.1	0.1	14.9	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	2.0	0.0	4.2	0.4	14.3	1.2	8.3	0.0	10.7
LnGrp Delay(d),s/veh	23.9	0.0	0.0	25.5	0.0	15.5	53.8	28.8	12.7	41.0	0.0	10.2
LnGrp LOS	C			C		B	D	C	B	D		B
Approach Vol, veh/h		36			411			803			1167	
Approach Delay, s/veh		23.9			18.3			27.3			19.6	
Approach LOS		C			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.8	33.2		16.8	4.8	48.2		16.8
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	19.0	30.5		18.5	5.5	44.0		18.5
Max Q Clear Time (g_c+I1), s	15.5	25.4		3.2	2.7	22.2		11.6
Green Ext Time (p_c), s	0.3	3.7		1.7	0.0	12.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	22.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Future Volume (veh/h)	53	46	58	64	52	43	137	324	84	30	134	314
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1843	1810	1845	1859	1900	1881	1870	1900	1845	1827	1881
Adj Flow Rate, veh/h	60	52	65	72	58	48	154	364	94	34	151	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	5	3	4	4	1	2	2	3	4	1
Cap, veh/h	132	114	211	242	130	107	201	819	209	70	402	352
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.29	0.29	0.04	0.22	0.00
Sat Flow, veh/h	962	834	1538	1757	942	780	1792	2805	716	1757	1827	1599
Grp Volume(v), veh/h	112	0	65	72	0	106	154	229	229	34	151	0
Grp Sat Flow(s),veh/h/ln	1795	0	1538	1757	0	1722	1792	1777	1744	1757	1827	1599
Q Serve(g_s), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Cycle Q Clear(g_c), s	2.1	0.0	1.4	1.3	0.0	2.1	3.0	3.8	3.9	0.7	2.6	0.0
Prop In Lane	0.54		1.00	1.00		0.45	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	247	0	211	242	0	237	201	519	509	70	402	352
V/C Ratio(X)	0.45	0.00	0.31	0.30	0.00	0.45	0.77	0.44	0.45	0.48	0.38	0.00
Avail Cap(c_a), veh/h	1258	0	1078	888	0	871	960	1724	1692	314	1120	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	14.1	14.1	0.0	14.4	15.7	10.5	10.5	17.1	12.1	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.3	0.3	0.0	0.5	2.3	0.3	0.3	1.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.6	0.7	0.0	1.0	1.6	1.9	1.9	0.4	1.3	0.0
LnGrp Delay(d),s/veh	14.9	0.0	14.4	14.4	0.0	14.9	18.0	10.8	10.8	19.0	12.4	0.0
LnGrp LOS	B		B	B		B	B	B	B	B	B	
Approach Vol, veh/h		177			178			612			185	
Approach Delay, s/veh		14.7			14.7			12.6			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	14.3		8.5	7.1	11.7		9.1
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	35.3		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	2.7	5.9		4.1	5.0	4.6		4.1
Green Ext Time (p_c), s	0.0	2.7		0.4	0.1	2.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	13.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	130	304	241	59	80	176
Future Vol, veh/h	130	304	241	59	80	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	1	2	2	4	5
Mvmt Flow	143	334	265	65	88	193

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	634	265	0	0	265	0
Stage 1	265	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Critical Hdwy	6.43	6.21	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	-	-	2.236	-
Pot Cap-1 Maneuver	442	776	-	-	1287	-
Stage 1	777	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	408	776	-	-	1287	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	777	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.7	0	2.5
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	611	1287	-
HCM Lane V/C Ratio	-	-	0.781	0.068	-
HCM Control Delay (s)	-	-	28.7	8	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	7.4	0.2	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	119	134	93	131	120	135
Future Vol, veh/h	119	134	93	131	120	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	2	7	5	3
Mvmt Flow	138	156	108	152	140	157

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	294	0	585	216
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	-	-	4.12	-	6.45	6.23
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.327
Pot Cap-1 Maneuver	-	-	1268	-	468	821
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1268	-	424	821
Mov Cap-2 Maneuver	-	-	-	-	424	-
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	629	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	570	-	-	1268	-
HCM Lane V/C Ratio	0.52	-	-	0.085	-
HCM Control Delay (s)	18	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	215	177	554	192	24	180	807	520	29	801	123
Future Volume (veh/h)	139	215	177	554	192	24	180	807	520	29	801	123
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	148	229	188	589	204	26	191	859	553	31	852	131
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	183	372	310	595	493	422	173	1236	835	45	990	602
Arrive On Green	0.10	0.20	0.20	0.17	0.26	0.26	0.10	0.36	0.36	0.02	0.28	0.28
Sat Flow, veh/h	1757	1881	1568	3476	1863	1594	1707	3471	1583	1810	3539	1568
Grp Volume(v), veh/h	148	229	188	589	204	26	191	859	553	31	852	131
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1594	1707	1736	1583	1810	1770	1568
Q Serve(g_s), s	6.6	8.9	8.7	13.5	7.2	1.0	8.1	16.9	20.3	1.4	18.3	4.5
Cycle Q Clear(g_c), s	6.6	8.9	8.7	13.5	7.2	1.0	8.1	16.9	20.3	1.4	18.3	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	183	372	310	595	493	422	173	1236	835	45	990	602
V/C Ratio(X)	0.81	0.62	0.61	0.99	0.41	0.06	1.10	0.70	0.66	0.69	0.86	0.22
Avail Cap(c_a), veh/h	244	565	471	595	620	530	173	1236	835	113	1071	638
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	29.3	29.2	33.1	24.3	22.0	35.9	22.0	13.7	38.7	27.3	16.6
Incr Delay (d2), s/veh	13.6	3.5	4.0	34.0	1.2	0.1	99.2	2.2	2.6	17.0	7.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	4.9	4.1	9.3	3.9	0.4	8.6	8.5	9.3	0.9	9.9	2.0
LnGrp Delay(d),s/veh	48.6	32.8	33.3	67.1	25.5	22.1	135.2	24.2	16.4	55.7	35.1	16.9
LnGrp LOS	D	C	C	E	C	C	F	C	B	E	D	B
Approach Vol, veh/h		565			819			1603			1014	
Approach Delay, s/veh		37.1			55.3			34.7			33.4	
Approach LOS		D			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	34.0	18.2	21.3	12.6	27.9	12.8	26.7
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	27.3	13.7	24.0	8.1	24.2	11.1	26.6
Max Q Clear Time (g_c+I1), s	3.4	22.3	15.5	10.9	10.1	20.3	8.6	9.2
Green Ext Time (p_c), s	0.0	4.9	0.0	4.9	0.0	2.1	0.1	5.8

Intersection Summary	
HCM 2010 Ctrl Delay	38.9
HCM 2010 LOS	D

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	215	0	72	0	1424	182	101	1431	0
Future Volume (vph)	0	0	69	215	0	72	0	1424	182	101	1431	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1577	1805		1455		5036	1599	1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1577	1805		1455		5036	1599	1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	224	0	75	0	1483	190	105	1491	0
RTOR Reduction (vph)	0	0	70	0	0	55	0	0	79	0	0	0
Lane Group Flow (vph)	0	0	2	224	0	20	0	1483	111	105	1491	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			1.7	8.5		14.7		23.3	31.8	3.1	30.4	
Effective Green, g (s)			1.7	8.5		14.7		23.3	31.8	3.1	30.4	
Actuated g/C Ratio			0.03	0.16		0.27		0.43	0.58	0.06	0.56	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			49	280		391		2149	931	99	1970	
v/s Ratio Prot				c0.12				0.29	0.02	0.06	c0.42	
v/s Ratio Perm			0.00			c0.01			0.05			
v/c Ratio			0.05	0.80		0.05		0.69	0.12	1.06	0.76	
Uniform Delay, d1			25.7	22.2		14.8		12.7	5.1	25.8	9.3	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.4	15.0		0.1		1.0	0.1	107.8	1.8	
Delay (s)			26.1	37.2		14.9		13.8	5.2	133.5	11.1	
Level of Service			C	D		B		B	A	F	B	
Approach Delay (s)		26.1			31.6			12.8			19.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	23	298	118	24	23	301	1678	98	64	1789	143
Future Volume (veh/h)	159	23	298	118	24	23	301	1678	98	64	1789	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1863	1881	1845	1863	1881
Adj Flow Rate, veh/h	166	24	310	123	25	24	314	1748	102	67	1864	149
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	1	3	2	1
Cap, veh/h	197	251	382	152	194	178	350	2056	928	87	1519	677
Arrive On Green	0.11	0.14	0.14	0.09	0.11	0.11	0.20	0.58	0.58	0.05	0.43	0.43
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	3539	1598	1757	3539	1577
Grp Volume(v), veh/h	166	24	310	123	25	24	314	1748	102	67	1864	149
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1770	1598	1757	1770	1577
Q Serve(g_s), s	10.9	1.3	12.6	8.0	1.5	1.6	20.5	47.7	3.3	4.4	50.0	6.9
Cycle Q Clear(g_c), s	10.9	1.3	12.6	8.0	1.5	1.6	20.5	47.7	3.3	4.4	50.0	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	251	382	152	194	178	350	2056	928	87	1519	677
V/C Ratio(X)	0.84	0.10	0.81	0.81	0.13	0.13	0.90	0.85	0.11	0.77	1.23	0.22
Avail Cap(c_a), veh/h	448	470	718	452	453	416	672	2056	928	302	1519	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.6	43.9	48.8	52.2	46.8	46.8	45.4	20.2	10.9	54.7	33.3	21.0
Incr Delay (d2), s/veh	9.2	0.2	4.2	9.6	0.3	0.3	8.3	3.9	0.1	13.5	108.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.7	5.1	4.3	0.7	0.7	10.7	24.2	1.5	2.5	47.1	3.1
LnGrp Delay(d),s/veh	59.8	44.1	53.0	61.9	47.1	47.1	53.6	24.2	11.0	68.2	141.5	21.3
LnGrp LOS	E	D	D	E	D	D	D	C	B	E	F	C
Approach Vol, veh/h		500			172			2164			2080	
Approach Delay, s/veh		54.8			57.7			27.8			130.6	
Approach LOS		D			E			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	72.7	14.1	20.0	27.4	55.0	17.2	16.9
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	6.4	49.7	10.0	14.6	22.5	52.0	12.9	3.6
Green Ext Time (p_c), s	0.1	0.3	0.3	1.4	0.9	0.0	0.4	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	75.1
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	550	603	200	490	570	1363	418	0	1963	261
Future Volume (veh/h)	245	0	550	603	200	490	570	1363	418	0	1963	261
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1833	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	255	0	573	628	434	359	594	1420	435	0	2045	272
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	178	0	0	1362	460	379	376	2747	847	0	1484	485
Arrive On Green	0.10	0.00	0.00	0.38	0.25	0.25	0.42	1.00	1.00	0.00	0.30	0.30
Sat Flow, veh/h	1810	255		3548	1833	1509	1810	5085	1568	0	5103	1615
Grp Volume(v), veh/h	255	287.9		628	434	359	594	1420	435	0	2045	272
Grp Sat Flow(s),veh/h/ln	1810	F		1774	1833	1509	1810	1695	1568	0	1647	1615
Q Serve(g_s), s	14.4			19.3	33.9	34.1	30.3	0.0	0.0	0.0	43.9	20.7
Cycle Q Clear(g_c), s	14.4			19.3	33.9	34.1	30.3	0.0	0.0	0.0	43.9	20.7
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	178			1362	460	379	376	2747	847	0	1484	485
V/C Ratio(X)	1.43			0.46	0.94	0.95	1.58	0.52	0.51	0.00	1.38	0.56
Avail Cap(c_a), veh/h	178			1419	490	403	376	2747	847	0	1484	485
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.21	0.21
Uniform Delay (d), s/veh	65.8			33.7	53.7	53.7	42.7	0.0	0.0	0.0	51.1	43.0
Incr Delay (d2), s/veh	222.1			0.1	25.8	30.2	274.2	0.7	2.2	0.0	170.9	1.0
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.2			9.5	20.5	17.4	43.6	0.2	0.5	0.0	43.4	9.4
LnGrp Delay(d),s/veh	287.9			33.8	79.5	84.0	316.9	0.7	2.2	0.0	222.0	43.9
LnGrp LOS	F			C	E	F	F	A	A		F	D
Approach Vol, veh/h					1421			2449			2317	
Approach Delay, s/veh					60.4			77.7			201.1	
Approach LOS					E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		85.1	60.9		35.0	50.1	19.0	41.9
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		76.5	58.4		* 30	41.5	14.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	21.3		32.3	45.9	16.4	36.1
Green Ext Time (p_c), s		26.4	0.5		0.0	0.0	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	126.6
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	730	362	160	238	0	539	0	1401	231	612	1181	563
Future Volume (veh/h)	730	362	160	238	0	539	0	1401	231	612	1181	563
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1827	1900	0	1900	0	1776	1900	1881	1845	1827
Adj Flow Rate, veh/h	753	373	165	245	0	556	0	1444	238	631	1218	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	4	0	0	0	0	7	0	1	3	4
Cap, veh/h	1027	441	193	258	0	0	0	1489	394	1186	2199	974
Arrive On Green	0.30	0.12	0.12	0.14	0.00	0.00	0.00	0.24	0.24	0.68	1.00	0.00
Sat Flow, veh/h	3442	3539	1553	1810	245		0	6357	1615	3476	3505	1553
Grp Volume(v), veh/h	753	373	165	245	104.2		0	1444	238	631	1218	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1553	1810	F		0	1527	1615	1738	1752	1553
Q Serve(g_s), s	28.7	15.1	15.2	19.6			0.0	34.2	13.6	13.2	0.0	0.0
Cycle Q Clear(g_c), s	28.7	15.1	15.2	19.6			0.0	34.2	13.6	13.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1027	441	193	258			0	1489	394	1186	2199	974
V/C Ratio(X)	0.73	0.85	0.85	0.95			0.00	0.97	0.60	0.53	0.55	0.00
Avail Cap(c_a), veh/h	1027	1018	447	258			0	1489	394	1186	2199	974
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.88	0.88	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.0	62.5	62.6	62.1			0.0	54.7	24.9	17.4	0.0	0.0
Incr Delay (d2), s/veh	2.6	1.8	4.1	42.1			0.0	15.7	5.9	0.2	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	7.5	6.7	12.8			0.0	16.1	6.7	6.2	0.3	0.0
LnGrp Delay(d),s/veh	48.6	64.3	66.7	104.2			0.0	70.4	30.9	17.6	1.0	0.0
LnGrp LOS	D	E	E	F				E	C	B	A	
Approach Vol, veh/h		1291						1682			1849	
Approach Delay, s/veh		55.4						64.8			6.7	
Approach LOS		E						E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	56.0	41.8	25.4	22.8		97.8	48.2	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	27.6	* 36	20.8	42.0		67.8	36.3	
Max Q Clear Time (g_c+I1), s	15.2	36.2	21.6	17.2		2.0	30.7	
Green Ext Time (p_c), s	3.7	0.0	0.0	1.0		4.4	1.3	

Intersection Summary	
HCM 2010 Ctrl Delay	43.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	0	73	90	0	178	77	1427	177	0	1349	143
Future Volume (veh/h)	131	0	73	90	0	178	77	1427	177	0	1349	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1267	1776	1863	1867	1900	0	1863	1863
Adj Flow Rate, veh/h	142	0	79	94	0	185	84	1486	184	0	1405	155
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.96	0.92	0.96	0.92	0.96	0.96	0.96	0.96	0.92
Percent Heavy Veh, %	2	2	2	2	2	7	2	2	2	0	2	2
Cap, veh/h	187	0	167	177	0	222	99	3485	431	0	1741	779
Arrive On Green	0.11	0.00	0.11	0.15	0.00	0.15	0.06	0.60	0.60	0.00	0.49	0.49
Sat Flow, veh/h	1774	0	1583	1206	0	1509	1774	5834	721	0	3632	1583
Grp Volume(v), veh/h	142	0	79	94	0	185	84	1227	443	0	1405	155
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1206	0	1509	1774	1605	1739	0	1770	1583
Q Serve(g_s), s	7.0	0.0	4.2	6.5	0.0	10.7	4.2	12.4	12.4	0.0	30.1	5.0
Cycle Q Clear(g_c), s	7.0	0.0	4.2	6.5	0.0	10.7	4.2	12.4	12.4	0.0	30.1	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	0.00		1.00
Lane Grp Cap(c), veh/h	187	0	167	177	0	222	99	2877	1039	0	1741	779
V/C Ratio(X)	0.76	0.00	0.47	0.53	0.00	0.83	0.85	0.43	0.43	0.00	0.81	0.20
Avail Cap(c_a), veh/h	355	0	317	241	0	302	99	2877	1039	0	1741	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	0.00	0.75	0.75
Uniform Delay (d), s/veh	39.1	0.0	37.9	35.5	0.0	37.3	42.1	9.8	9.8	0.0	19.3	12.9
Incr Delay (d2), s/veh	6.2	0.0	2.1	2.4	0.0	13.5	40.0	0.4	1.0	0.0	3.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	1.9	2.3	0.0	5.3	3.2	5.5	6.2	0.0	15.4	2.2
LnGrp Delay(d),s/veh	45.3	0.0	40.0	38.0	0.0	50.9	82.1	10.2	10.8	0.0	22.4	13.3
LnGrp LOS	D		D	D		D	F	B	B		C	B
Approach Vol, veh/h		221			279			1754			1560	
Approach Delay, s/veh		43.4			46.5			13.8			21.5	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		58.3		14.0	9.5	48.8		17.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		40.5		18.0	5.0	31.0		18.0
Max Q Clear Time (g_c+I1), s		14.4		9.0	6.2	32.1		12.7
Green Ext Time (p_c), s		23.4		0.5	0.0	0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	3	114	1	102	1	1576	126	122	1384	5
Future Volume (veh/h)	3	0	3	114	1	102	1	1576	126	122	1384	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1827	1900	1900	1900	1863	1881	1727	1863	1900
Adj Flow Rate, veh/h	3	0	3	118	1	105	1	1625	130	126	1427	5
Adj No. of Lanes	1	1	0	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	4	0	0	0	2	1	10	2	0
Cap, veh/h	7	0	32	237	164	139	3	2515	790	157	2083	950
Arrive On Green	0.00	0.00	0.02	0.07	0.09	0.09	0.00	0.49	0.49	0.10	0.59	0.59
Sat Flow, veh/h	1810	0	1615	3375	1900	1615	1810	5085	1597	1645	3539	1614
Grp Volume(v), veh/h	3	0	3	118	1	105	1	1625	130	126	1427	5
Grp Sat Flow(s),veh/h/ln	1810	0	1615	1688	1900	1615	1810	1695	1597	1645	1770	1614
Q Serve(g_s), s	0.1	0.0	0.1	2.1	0.0	3.9	0.0	14.7	2.8	4.6	17.2	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.1	2.1	0.0	3.9	0.0	14.7	2.8	4.6	17.2	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	7	0	32	237	164	139	3	2515	790	157	2083	950
V/C Ratio(X)	0.41	0.00	0.09	0.50	0.01	0.76	0.34	0.65	0.16	0.80	0.68	0.01
Avail Cap(c_a), veh/h	146	0	850	403	1074	913	146	2653	833	210	2083	950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	29.8	27.7	25.9	27.7	30.9	11.6	8.6	27.4	8.8	5.3
Incr Delay (d2), s/veh	32.5	0.0	1.5	1.6	0.0	9.6	57.9	0.6	0.1	14.8	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	1.0	0.0	2.1	0.1	6.9	1.2	2.7	8.6	0.0
LnGrp Delay(d),s/veh	63.3	0.0	31.3	29.4	25.9	37.2	88.8	12.2	8.7	42.2	9.8	5.3
LnGrp LOS	E		C	C	C	D	F	B	A	D	A	A
Approach Vol, veh/h		6			224			1756			1558	
Approach Delay, s/veh		47.3			33.0			12.0			12.4	
Approach LOS		D			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	36.4	8.8	6.2	4.6	42.2	4.8	10.3
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	7.9	32.3	7.4	32.6	5.0	35.2	5.0	35.0
Max Q Clear Time (g_c+I1), s	6.6	16.7	4.1	2.1	2.0	19.2	2.1	5.9
Green Ext Time (p_c), s	0.0	13.9	0.1	0.4	0.0	15.3	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	20	15	1666	1474	27
Future Volume (veh/h)	37	20	15	1666	1474	27
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1900	1863	1846	1900
Adj Flow Rate, veh/h	40	22	16	1811	1602	29
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	0	2	3	3
Cap, veh/h	209	99	37	2462	2895	52
Arrive On Green	0.06	0.06	0.02	0.70	0.57	0.57
Sat Flow, veh/h	3408	1615	1810	3632	5262	92
Grp Volume(v), veh/h	40	22	16	1811	1056	575
Grp Sat Flow(s),veh/h/ln	1704	1615	1810	1770	1680	1829
Q Serve(g_s), s	0.5	0.5	0.4	13.4	8.3	8.3
Cycle Q Clear(g_c), s	0.5	0.5	0.4	13.4	8.3	8.3
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	209	99	37	2462	1908	1039
V/C Ratio(X)	0.19	0.22	0.44	0.74	0.55	0.55
Avail Cap(c_a), veh/h	1503	712	216	2640	1908	1039
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	18.7	20.3	4.0	5.7	5.7
Incr Delay (d2), s/veh	0.4	1.1	8.0	1.1	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	6.7	3.9	4.4
LnGrp Delay(d),s/veh	19.1	19.9	28.3	5.1	6.1	6.4
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	62			1827	1631	
Approach Delay, s/veh	19.4			5.3	6.2	
Approach LOS	B			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		7.1	5.4	29.5				34.9
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	5.0	21.8				31.3
Max Q Clear Time (g_c+I1), s		2.5	2.4	10.3				15.4
Green Ext Time (p_c), s		0.1	0.0	11.3				13.8

Intersection Summary	
HCM 2010 Ctrl Delay	6.0
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	312	300	337	95	278	215	352	1191	97	196	1021	254
Future Volume (veh/h)	312	300	337	95	278	215	352	1191	97	196	1021	254
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1881	1863	1840	1900	1827	1856	1900	1863	1863	1827
Adj Flow Rate, veh/h	325	312	351	99	290	224	367	1241	101	204	1064	265
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	1	2	5	5	4	2	2	2	2	4
Cap, veh/h	338	1045	467	101	305	227	452	1163	94	203	1693	506
Arrive On Green	0.19	0.30	0.30	0.06	0.16	0.16	0.13	0.35	0.35	0.11	0.33	0.33
Sat Flow, veh/h	1774	3539	1583	1774	1882	1404	3375	3301	268	1774	5085	1521
Grp Volume(v), veh/h	325	312	351	99	269	245	367	662	680	204	1064	265
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1748	1538	1688	1763	1806	1774	1695	1521
Q Serve(g_s), s	19.1	7.2	21.1	5.9	16.0	16.7	11.1	37.0	37.0	12.0	18.5	14.8
Cycle Q Clear(g_c), s	19.1	7.2	21.1	5.9	16.0	16.7	11.1	37.0	37.0	12.0	18.5	14.8
Prop In Lane	1.00		1.00	1.00		0.91	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	338	1045	467	101	283	249	452	621	636	203	1693	506
V/C Ratio(X)	0.96	0.30	0.75	0.98	0.95	0.99	0.81	1.06	1.07	1.01	0.63	0.52
Avail Cap(c_a), veh/h	338	1045	467	101	283	249	547	621	636	203	1693	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.1	28.6	33.5	49.4	43.6	43.9	44.2	34.0	34.0	46.5	29.5	28.3
Incr Delay (d2), s/veh	38.7	0.6	9.6	81.6	40.1	52.8	10.0	54.6	55.6	64.8	0.9	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	3.6	10.4	5.2	10.8	10.7	5.8	27.4	28.2	9.5	8.8	6.4
LnGrp Delay(d),s/veh	80.9	29.2	43.1	131.0	83.7	96.6	54.2	88.6	89.6	111.3	30.4	29.6
LnGrp LOS	F	C	D	F	F	F	D	F	F	F	C	C
Approach Vol, veh/h		988			613			1709			1533	
Approach Delay, s/veh		51.1			96.5			81.6			41.0	
Approach LOS		D			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	42.0	10.0	37.0	18.0	40.0	24.0	23.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	12.0	37.0	6.0	31.0	17.0	32.0	20.0	17.0
Max Q Clear Time (g_c+I1), s	14.0	39.0	7.9	23.1	13.1	20.5	21.1	18.7
Green Ext Time (p_c), s	0.0	0.0	0.0	5.8	1.0	11.2	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	64.4
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	23	97	46	10	42	107	432	58	40	523	81
Future Volume (veh/h)	58	23	97	46	10	42	107	432	58	40	523	81
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1771	1810	1900	1729	1900	1792	1803	1900	1597	1863	1863
Adj Flow Rate, veh/h	64	25	107	51	11	46	118	475	64	44	575	89
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	90	20	576	95	11	605	146	593	80	63	628	522
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.09	0.38	0.38	0.04	0.34	0.34
Sat Flow, veh/h	0	53	1536	0	29	1613	1707	1556	210	1521	1863	1548
Grp Volume(v), veh/h	89	0	107	62	0	46	118	0	539	44	575	89
Grp Sat Flow(s),veh/h/ln	54	0	1536	29	0	1613	1707	0	1766	1521	1863	1548
Q Serve(g_s), s	0.0	0.0	3.2	0.0	0.0	1.3	4.7	0.0	18.8	2.0	20.5	2.8
Cycle Q Clear(g_c), s	25.9	0.0	3.2	25.9	0.0	1.3	4.7	0.0	18.8	2.0	20.5	2.8
Prop In Lane	0.72		1.00	0.82		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	110	0	576	106	0	605	146	0	673	63	628	522
V/C Ratio(X)	0.81	0.00	0.19	0.59	0.00	0.08	0.81	0.00	0.80	0.70	0.92	0.17
Avail Cap(c_a), veh/h	110	0	576	106	0	605	146	0	673	119	652	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	14.5	30.1	0.0	13.9	31.0	0.0	19.0	32.7	22.0	16.1
Incr Delay (d2), s/veh	35.8	0.0	0.2	8.8	0.0	0.1	28.2	0.0	8.2	15.3	18.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	1.4	1.4	0.0	0.6	3.3	0.0	10.7	1.1	13.7	1.2
LnGrp Delay(d),s/veh	64.6	0.0	14.7	38.8	0.0	14.0	59.3	0.0	27.3	48.0	40.8	16.5
LnGrp LOS	E		B	D		B	E		C	D	D	B
Approach Vol, veh/h		196			108			657			708	
Approach Delay, s/veh		37.3			28.2			33.0			38.2	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	31.7		30.4	10.0	28.7		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.4	24.7		25.9	5.9	24.2		25.9
Max Q Clear Time (g_c+I1), s	4.0	20.8		27.9	6.7	22.5		27.9
Green Ext Time (p_c), s	0.0	3.3		0.0	0.0	0.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	35.4
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	111	19	586	121	232	14	642	569	199	553	45
Future Volume (veh/h)	50	111	19	586	121	232	14	642	569	199	553	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1850	1881	1900	1845	1881	1827	1859	1900
Adj Flow Rate, veh/h	53	118	20	715	0	247	15	683	605	212	588	48
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	6	1	0	3	1	4	2	2
Cap, veh/h	156	267	44	904	0	401	26	1181	538	171	1389	113
Arrive On Green	0.09	0.09	0.09	0.25	0.00	0.25	0.01	0.34	0.34	0.10	0.42	0.42
Sat Flow, veh/h	1810	3092	512	3583	0	1589	1810	3505	1596	1740	3300	269
Grp Volume(v), veh/h	53	68	70	715	0	247	15	683	605	212	314	322
Grp Sat Flow(s),veh/h/ln	1810	1805	1799	1792	0	1589	1810	1752	1596	1740	1766	1804
Q Serve(g_s), s	2.3	2.9	3.0	15.2	0.0	11.2	0.7	13.1	27.5	8.0	10.2	10.3
Cycle Q Clear(g_c), s	2.3	2.9	3.0	15.2	0.0	11.2	0.7	13.1	27.5	8.0	10.2	10.3
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	156	156	155	904	0	401	26	1181	538	171	743	759
V/C Ratio(X)	0.34	0.43	0.45	0.79	0.00	0.62	0.59	0.58	1.13	1.24	0.42	0.42
Avail Cap(c_a), veh/h	621	619	617	1229	0	545	89	1181	538	171	743	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	35.4	35.5	28.5	0.0	27.0	40.0	22.3	27.1	36.8	16.7	16.7
Incr Delay (d2), s/veh	1.3	1.9	2.1	2.5	0.0	1.5	19.5	0.9	78.1	149.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.5	1.6	7.9	0.0	5.1	0.5	6.5	23.6	10.9	5.1	5.2
LnGrp Delay(d),s/veh	36.4	37.3	37.5	31.0	0.0	28.6	59.6	23.2	105.1	185.9	17.2	17.2
LnGrp LOS	D	D	D	C		C	E	C	F	F	B	B
Approach Vol, veh/h		191			962			1303			848	
Approach Delay, s/veh		37.1			30.4			61.6			59.4	
Approach LOS		D			C			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	32.5		12.0	5.2	39.3		25.1
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	8.0	27.5		28.0	4.0	31.5		28.0
Max Q Clear Time (g_c+I1), s	10.0	29.5		5.0	2.7	12.3		17.2
Green Ext Time (p_c), s	0.0	0.0		0.8	0.0	14.2		2.9

Intersection Summary	
HCM 2010 Ctrl Delay	50.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	279	733	14	22	723	504	43	15	22	450	24	273
Future Volume (veh/h)	279	733	14	22	723	504	43	15	22	450	24	273
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1846	1900	1881	1875	1863
Adj Flow Rate, veh/h	297	780	15	23	769	0	46	16	23	498	0	290
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	298	1543	30	34	1012	440	145	55	79	881	0	387
Arrive On Green	0.17	0.43	0.43	0.02	0.28	0.00	0.08	0.08	0.08	0.25	0.00	0.25
Sat Flow, veh/h	1792	3588	69	1723	3574	1553	1810	679	977	3583	0	1576
Grp Volume(v), veh/h	297	389	406	23	769	0	46	0	39	498	0	290
Grp Sat Flow(s),veh/h/ln	1792	1787	1869	1723	1787	1553	1810	0	1656	1792	0	1576
Q Serve(g_s), s	14.4	13.8	13.8	1.2	17.1	0.0	2.1	0.0	1.9	10.6	0.0	14.8
Cycle Q Clear(g_c), s	14.4	13.8	13.8	1.2	17.1	0.0	2.1	0.0	1.9	10.6	0.0	14.8
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	298	769	804	34	1012	440	145	0	133	881	0	387
V/C Ratio(X)	1.00	0.51	0.51	0.68	0.76	0.00	0.32	0.00	0.29	0.57	0.00	0.75
Avail Cap(c_a), veh/h	298	769	804	113	1109	482	145	0	133	1317	0	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	18.1	18.1	42.4	28.5	0.0	37.8	0.0	37.7	28.8	0.0	30.3
Incr Delay (d2), s/veh	50.7	1.9	1.8	21.4	4.7	0.0	5.6	0.0	5.5	0.8	0.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	7.2	7.5	0.8	9.1	0.0	1.3	0.0	1.1	5.4	0.0	6.9
LnGrp Delay(d),s/veh	87.0	19.9	19.9	63.8	33.2	0.0	43.4	0.0	43.2	29.6	0.0	34.5
LnGrp LOS	F	B	B	E	C		D		D	C		C
Approach Vol, veh/h		1092			792			85			788	
Approach Delay, s/veh		38.1			34.1			43.3			31.4	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	6.2	42.4		26.4	19.0	29.7
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	5.7	35.8		32.0	14.5	27.0
Max Q Clear Time (g_c+I1), s		4.1	3.2	15.8		16.8	16.4	19.1
Green Ext Time (p_c), s		0.1	0.0	17.1		4.1	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.2
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	813	478	511	1105	0	0	0	0	33	2	192
Future Volume (veh/h)	0	813	478	511	1105	0	0	0	0	33	2	192
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1845	1863	0				1827	1863	1900
Adj Flow Rate, veh/h	0	856	503	538	1163	0				35	2	202
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	3	2	0				4	0	4
Cap, veh/h	0	1289	575	558	2634	0				267	2	241
Arrive On Green	0.00	0.36	0.36	0.32	0.74	0.00				0.15	0.15	0.15
Sat Flow, veh/h	0	3632	1579	1757	3632	0				1740	16	1570
Grp Volume(v), veh/h	0	856	503	538	1163	0				35	0	204
Grp Sat Flow(s),veh/h/ln	0	1770	1579	1757	1770	0				1740	0	1586
Q Serve(g_s), s	0.0	18.3	26.7	27.1	11.3	0.0				1.6	0.0	11.2
Cycle Q Clear(g_c), s	0.0	18.3	26.7	27.1	11.3	0.0				1.6	0.0	11.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1289	575	558	2634	0				267	0	243
V/C Ratio(X)	0.00	0.66	0.87	0.96	0.44	0.00				0.13	0.00	0.84
Avail Cap(c_a), veh/h	0	1289	575	558	2634	0				445	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	0.85	0.35	0.35	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.0	26.7	30.2	4.4	0.0				32.9	0.0	37.0
Incr Delay (d2), s/veh	0.0	2.3	14.6	14.6	0.2	0.0				0.1	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.3	13.9	15.4	5.4	0.0				0.8	0.0	5.1
LnGrp Delay(d),s/veh	0.0	26.3	41.3	44.8	4.6	0.0				33.0	0.0	40.2
LnGrp LOS		C	D	D	A					C		D
Approach Vol, veh/h		1359			1701						239	
Approach Delay, s/veh		31.8			17.3						39.1	
Approach LOS		C			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	34.2	37.9		17.9		72.1		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	28.6	23.6		23.0		57.8		
Max Q Clear Time (g_c+I1), s	29.1	28.7		13.2		13.3		
Green Ext Time (p_c), s	0.0	0.0		0.6		17.6		

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	680	0	0	1067	76	549	3	491	0	0	0
Future Volume (veh/h)	166	680	0	0	1067	76	549	3	491	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1848	1900	1845	1832	1827			
Adj Flow Rate, veh/h	184	756	0	0	1186	84	781	0	365			
Adj No. of Lanes	1	2	0	0	2	0	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	1	1	0	0	3	3	3	33	4			
Cap, veh/h	226	2136	0	0	1390	98	944	0	417			
Arrive On Green	0.13	0.60	0.00	0.00	0.42	0.42	0.27	0.00	0.27			
Sat Flow, veh/h	1792	3668	0	0	3420	235	3514	0	1553			
Grp Volume(v), veh/h	184	756	0	0	625	645	781	0	365			
Grp Sat Flow(s),veh/h/ln	1792	1787	0	0	1756	1807	1757	0	1553			
Q Serve(g_s), s	6.5	7.0	0.0	0.0	20.9	21.0	13.6	0.0	14.6			
Cycle Q Clear(g_c), s	6.5	7.0	0.0	0.0	20.9	21.0	13.6	0.0	14.6			
Prop In Lane	1.00		0.00	0.00		0.13	1.00		1.00			
Lane Grp Cap(c), veh/h	226	2136	0	0	733	755	944	0	417			
V/C Ratio(X)	0.81	0.35	0.00	0.00	0.85	0.85	0.83	0.00	0.88			
Avail Cap(c_a), veh/h	234	2136	0	0	733	755	968	0	428			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	0.84	0.84	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.7	6.7	0.0	0.0	17.1	17.1	22.4	0.0	22.7			
Incr Delay (d2), s/veh	12.5	0.3	0.0	0.0	10.4	10.2	6.2	0.0	18.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	3.5	0.0	0.0	12.2	12.5	7.3	0.0	8.3			
LnGrp Delay(d),s/veh	40.2	7.0	0.0	0.0	27.5	27.4	28.6	0.0	40.9			
LnGrp LOS	D	A			C	C	C		D			
Approach Vol, veh/h		940			1270			1146				
Approach Delay, s/veh		13.5			27.4			32.5				
Approach LOS		B			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		43.4			11.7	31.7		21.6
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		38.4			8.5	26.4		17.9
Max Q Clear Time (g_c+I1), s		9.0			8.5	23.0		16.6
Green Ext Time (p_c), s		12.2			0.0	2.6		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1004	84	16	1052	0	91	0	20	0	0	0
Future Volume (veh/h)	59	1004	84	16	1052	0	91	0	20	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1864	1900	1900	1845	0	1900	0	1900			
Adj Flow Rate, veh/h	64	1091	91	17	1143	0	99	0	22			
Adj No. of Lanes	1	2	0	1	2	0	1	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	0	3	0	0	0	0			
Cap, veh/h	134	1956	163	31	1875	0	146	0	130			
Arrive On Green	0.07	0.59	0.59	0.02	0.53	0.00	0.08	0.00	0.08			
Sat Flow, veh/h	1810	3303	275	1810	3597	0	1810	0	1615			
Grp Volume(v), veh/h	64	585	597	17	1143	0	99	0	22			
Grp Sat Flow(s),veh/h/ln	1810	1771	1808	1810	1752	0	1810	0	1615			
Q Serve(g_s), s	1.5	8.8	8.8	0.4	9.8	0.0	2.3	0.0	0.6			
Cycle Q Clear(g_c), s	1.5	8.8	8.8	0.4	9.8	0.0	2.3	0.0	0.6			
Prop In Lane	1.00		0.15	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	134	1049	1070	31	1875	0	146	0	130			
V/C Ratio(X)	0.48	0.56	0.56	0.55	0.61	0.00	0.68	0.00	0.17			
Avail Cap(c_a), veh/h	249	1049	1070	229	1972	0	873	0	779			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.3	5.4	5.4	21.2	7.0	0.0	19.5	0.0	18.7			
Incr Delay (d2), s/veh	2.6	1.4	1.4	14.4	1.0	0.0	5.4	0.0	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	4.6	4.7	0.3	4.9	0.0	1.4	0.0	0.3			
LnGrp Delay(d),s/veh	21.9	6.8	6.8	35.6	8.0	0.0	24.8	0.0	19.3			
LnGrp LOS	C	A	A	D	A		C		B			
Approach Vol, veh/h		1246			1160			121				
Approach Delay, s/veh		7.6			8.4			23.8				
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	4.7	30.8			7.2	28.3		8.0
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.5	25.0			6.0	24.5		21.0
Max Q Clear Time (g_c+I1), s	2.4	10.8			3.5	11.8		4.3
Green Ext Time (p_c), s	0.0	13.8			0.0	11.5		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	1606	1715	0
Future Vol, veh/h	0	0	7	1606	1715	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	1656	1768	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	884	1768	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	292	357	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	292	357	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	357	-	-	-	-
HCM Lane V/C Ratio	0.02	-	-	-	-
HCM Control Delay (s)	15.3	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	106	130	466	380	80
Future Vol, veh/h	81	106	130	466	380	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	370	-	220	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	2	1	9
Mvmt Flow	88	115	141	507	413	87

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	993	250	500	0	-	0
Stage 1	457	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	246	756	1040	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	213	756	1040	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	481	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.4	2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1040	-	213	756	-	-
HCM Lane V/C Ratio	0.136	-	0.413	0.152	-	-
HCM Control Delay (s)	9	-	33.3	10.6	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.5	-	1.9	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	938	96	26	984	8	109	1	23	18	3	85
Future Volume (veh/h)	33	938	96	26	984	8	109	1	23	18	3	85
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1866	1900	1900	1863	1900	1900	1780	1900	1900	1900	1900
Adj Flow Rate, veh/h	35	987	101	27	1036	8	115	1	24	19	53	56
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	69	1499	153	56	1704	13	169	6	137	39	109	128
Arrive On Green	0.04	0.46	0.46	0.03	0.47	0.47	0.09	0.09	0.09	0.08	0.08	0.08
Sat Flow, veh/h	1810	3248	332	1810	3600	28	1810	61	1462	495	1380	1615
Grp Volume(v), veh/h	35	539	549	27	509	535	115	0	25	72	0	56
Grp Sat Flow(s),veh/h/ln	1810	1773	1808	1810	1770	1858	1810	0	1522	1875	0	1615
Q Serve(g_s), s	1.0	12.6	12.6	0.8	11.4	11.4	3.3	0.0	0.8	2.0	0.0	1.8
Cycle Q Clear(g_c), s	1.0	12.6	12.6	0.8	11.4	11.4	3.3	0.0	0.8	2.0	0.0	1.8
Prop In Lane	1.00		0.18	1.00		0.01	1.00		0.96	0.26		1.00
Lane Grp Cap(c), veh/h	69	818	834	56	837	879	169	0	142	149	0	128
V/C Ratio(X)	0.51	0.66	0.66	0.48	0.61	0.61	0.68	0.00	0.18	0.48	0.00	0.44
Avail Cap(c_a), veh/h	168	924	942	168	922	968	1010	0	850	174	0	150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.4	11.2	11.2	25.6	10.5	10.5	23.6	0.0	22.5	23.7	0.0	23.6
Incr Delay (d2), s/veh	5.8	3.4	3.3	6.3	2.7	2.5	4.7	0.0	0.6	2.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.9	7.0	0.5	6.1	6.4	1.9	0.0	0.4	1.1	0.0	0.9
LnGrp Delay(d),s/veh	31.1	14.6	14.5	32.0	13.1	13.0	28.3	0.0	23.0	26.1	0.0	25.9
LnGrp LOS	C	B	B	C	B	B	C		C	C		C
Approach Vol, veh/h		1123			1071			140			128	
Approach Delay, s/veh		15.1			13.5			27.4			26.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	29.8		9.0	6.0	30.4		8.3
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 28		30.0	5.0	28.0		5.0
Max Q Clear Time (g_c+I1), s	2.8	14.6		5.3	3.0	13.4		4.0
Green Ext Time (p_c), s	1.9	10.2		0.4	0.0	10.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	499	229	1380	528	221	1494
Future Volume (veh/h)	499	229	1380	528	221	1494
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	542	249	1500	574	240	1624
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	731	336	2024	967	290	2254
Arrive On Green	0.21	0.21	0.40	0.40	0.16	0.64
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	542	249	1500	574	240	1624
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	8.8	8.8	15.0	13.2	7.8	18.4
Cycle Q Clear(g_c), s	8.8	8.8	15.0	13.2	7.8	18.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	731	336	2024	967	290	2254
V/C Ratio(X)	0.74	0.74	0.74	0.59	0.83	0.72
Avail Cap(c_a), veh/h	1038	478	2024	967	342	2254
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	22.0	15.3	7.1	24.2	7.3
Incr Delay (d2), s/veh	1.7	3.7	2.5	2.7	13.6	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	4.1	7.4	9.5	4.9	9.4
LnGrp Delay(d),s/veh	23.7	25.7	17.8	9.8	37.7	9.3
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	791		2074			1864
Approach Delay, s/veh	24.3		15.6			13.0
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.2	28.3				42.5		17.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	11.5	22.0				38.0		18.0
Max Q Clear Time (g_c+I1), s	9.8	17.0				20.4		10.8
Green Ext Time (p_c), s	0.1	4.9				16.9		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	269	15	0	287	0	6
Future Vol, veh/h	269	15	0	287	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	292	16	0	312	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	300
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	740
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	740
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	740	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	9.9	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Intersection Delay, s/veh	54
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	195	335	354	174	4	356	3	159	3	2	11
Future Vol, veh/h	6	195	335	354	174	4	356	3	159	3	2	11
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	17	6	5	2	6	0	4	0	6	0	0	0
Mvmt Flow	7	241	414	437	215	5	440	4	196	4	2	14
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	33.9	60.3	69.7	13.6
HCM LOS	D	F	F	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	99%	0%	3%	0%	100%	0%	19%
Vol Thru, %	1%	0%	97%	0%	0%	98%	12%
Vol Right, %	0%	100%	0%	100%	0%	2%	69%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	359	159	201	335	354	178	16
LT Vol	356	0	6	0	354	0	3
Through Vol	3	0	195	0	0	174	2
RT Vol	0	159	0	335	0	4	11
Lane Flow Rate	443	196	248	414	437	220	20
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	1.069	0.402	0.573	0.851	1.025	0.488	0.053
Departure Headway (Hd)	8.797	7.494	8.675	7.739	8.819	8.355	10.012
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	417	483	419	471	415	435	360
Service Time	6.497	5.194	6.375	5.439	6.519	6.055	8.012
HCM Lane V/C Ratio	1.062	0.406	0.592	0.879	1.053	0.506	0.056
HCM Control Delay	93.9	15.1	22.4	40.8	81.2	18.8	13.6
HCM Lane LOS	F	C	C	E	F	C	B
HCM 95th-tile Q	14.7	1.9	3.5	8.6	13.2	2.6	0.2

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	66	748	20	44	670
Future Vol, veh/h	25	66	748	20	44	670
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	3	0	12	4
Mvmt Flow	26	69	779	21	46	698

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1580	790	0	0	800	0
Stage 1	790	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.22	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.308	-
Pot Cap-1 Maneuver	121	393	-	-	781	-
Stage 1	451	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	114	393	-	-	781	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	424	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.3	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	235	781	-
HCM Lane V/C Ratio	-	-	0.403	0.059	-
HCM Control Delay (s)	-	-	30.3	9.9	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.2	-

Intersection	
Int Delay, s/veh	9.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	3	73	1	2	6	768	54	6	714	2
Future Vol, veh/h	1	3	3	73	1	2	6	768	54	6	714	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	210	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	4	8	0	4	50
Mvmt Flow	1	3	3	79	1	2	7	835	59	7	776	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1638	1638	777	1640	1639	835	778	0	0	835	0	0
Stage 1	790	790	-	848	848	-	-	-	-	-	-	-
Stage 2	848	848	-	792	791	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	81	102	400	81	101	371	848	-	-	807	-	-
Stage 1	386	404	-	359	380	-	-	-	-	-	-	-
Stage 2	359	380	-	385	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	79	100	400	~ 77	99	371	848	-	-	807	-	-
Mov Cap-2 Maneuver	79	100	-	~ 77	99	-	-	-	-	-	-	-
Stage 1	383	400	-	356	377	-	-	-	-	-	-	-
Stage 2	353	377	-	375	400	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.8	205.3	0.1	0.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	848	-	-	94	400	77	371	807	-	-
HCM Lane V/C Ratio	0.008	-	-	0.046	0.008	1.045	0.006	0.008	-	-
HCM Control Delay (s)	9.3	-	-	45.1	14.1	210.4	14.8	9.5	-	-
HCM Lane LOS	A	-	-	E	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	5.7	0	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	27.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	29	130	69	11	4	106	181	48	7	181	57
Future Vol, veh/h	87	29	130	69	11	4	106	181	48	7	181	57
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Heavy Vehicles, %	3	0	1	2	0	0	0	2	5	0	3	4
Mvmt Flow	143	48	213	113	18	7	174	297	79	11	297	93
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	2
HCM Control Delay	19.3	19.1	36.3	26.6
HCM LOS	C	C	E	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	75%	0%	82%	100%	0%	0%
Vol Thru, %	0%	79%	25%	0%	13%	0%	100%	0%
Vol Right, %	0%	21%	0%	100%	5%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	106	229	116	130	84	7	181	57
LT Vol	106	0	87	0	69	7	0	0
Through Vol	0	181	29	0	11	0	181	0
RT Vol	0	48	0	130	4	0	0	57
Lane Flow Rate	174	375	190	213	138	11	297	93
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.43	0.862	0.489	0.479	0.386	0.029	0.724	0.21
Departure Headway (Hd)	8.906	8.27	9.255	8.095	10.092	9.25	8.786	8.079
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	405	439	390	445	357	387	412	444
Service Time	6.66	6.024	7.013	5.853	7.861	7.007	6.542	5.835
HCM Lane V/C Ratio	0.43	0.854	0.487	0.479	0.387	0.028	0.721	0.209
HCM Control Delay	18.2	44.7	20.6	18.1	19.1	12.3	31.5	13
HCM Lane LOS	C	E	C	C	C	B	D	B
HCM 95th-tile Q	2.1	8.7	2.6	2.5	1.8	0.1	5.6	0.8

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	23	350	350	2
Future Vol, veh/h	1	11	23	350	350	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	4	3	2	0
Mvmt Flow	1	12	26	389	389	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	830	390	391	0	-	0
Stage 1	390	-	-	-	-	-
Stage 2	440	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	343	663	1157	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	335	663	1157	-	-	-
Mov Cap-2 Maneuver	335	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	638	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1157	-	613	-	-
HCM Lane V/C Ratio	0.022	-	0.022	-	-
HCM Control Delay (s)	8.2	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	78	125	248	66	124	237
Future Vol, veh/h	78	125	248	66	124	237
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	4	15	2	3
Mvmt Flow	85	136	270	72	135	258

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	832	305	0	0	341	0
Stage 1	305	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	342	740	-	-	1218	-
Stage 1	752	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	304	740	-	-	1218	-
Mov Cap-2 Maneuver	304	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.9	0	2.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	477	1218	-
HCM Lane V/C Ratio	-	-	0.463	0.111	-
HCM Control Delay (s)	-	-	18.9	8.3	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.4	0.4	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	346	3	0	313
Future Vol, veh/h	1	1	346	3	0	313
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	2	2	721	6	0	652

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1376	724	0	0	727	0
Stage 1	724	-	-	-	-	-
Stage 2	652	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	162	429	-	-	886	-
Stage 1	484	-	-	-	-	-
Stage 2	522	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	162	429	-	-	886	-
Mov Cap-2 Maneuver	162	-	-	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	522	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	162	429	886	-
HCM Lane V/C Ratio	-	-	0.013	0.005	-	-
HCM Control Delay (s)	-	-	27.5	13.4	0	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	29	0	13	2	336	35	13	301	0
Future Vol, veh/h	0	0	1	29	0	13	2	336	35	13	301	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	51	51	51	51	51	51	51	51	51	51	51	51
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	2	0
Mvmt Flow	0	0	2	57	0	25	4	659	69	25	590	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1355	1376	590	1343	1342	693	590	0	0	727	0	0
Stage 1	641	641	-	701	701	-	-	-	-	-	-	-
Stage 2	714	735	-	642	641	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	128	146	511	130	154	447	995	-	-	886	-	-
Stage 1	466	473	-	433	444	-	-	-	-	-	-	-
Stage 2	425	428	-	466	473	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	118	141	511	126	149	447	995	-	-	886	-	-
Mov Cap-2 Maneuver	118	141	-	126	149	-	-	-	-	-	-	-
Stage 1	464	460	-	431	442	-	-	-	-	-	-	-
Stage 2	399	426	-	451	460	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	48.2	0	0.4
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	995	-	-	511	162	886	-	-
HCM Lane V/C Ratio	0.004	-	-	0.004	0.508	0.029	-	-
HCM Control Delay (s)	8.6	-	-	12.1	48.2	9.2	-	-
HCM Lane LOS	A	-	-	B	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	2.5	0.1	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	17	356	69	7	324
Future Vol, veh/h	68	17	356	69	7	324
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	52	52	52	52	52	52
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	131	33	685	133	13	623

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1401	751	0	0	817	0
Stage 1	751	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	156	414	-	-	820	-
Stage 1	470	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	154	414	-	-	820	-
Mov Cap-2 Maneuver	294	-	-	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	515	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	294	414	820	-
HCM Lane V/C Ratio	-	-	0.445	0.079	0.016	-
HCM Control Delay (s)	-	-	26.7	14.4	9.5	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.3	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	33	44	398	387	1
Future Vol, veh/h	0	33	44	398	387	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	55	55	55	55
Heavy Vehicles, %	0	12	10	1	1	0
Mvmt Flow	0	60	80	724	704	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1589	705	705	0	-	0
Stage 1	705	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.29	-	-	-
Pot Cap-1 Maneuver	120	420	857	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	407	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	109	420	857	-	-	-
Mov Cap-2 Maneuver	241	-	-	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	369	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15	1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	857	-	420	-	-
HCM Lane V/C Ratio	0.093	-	0.143	-	-
HCM Control Delay (s)	9.6	-	15	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-

Intersection	
Int Delay, s/veh	12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	184	9	2	19	144	728	5	5	838	8
Future Vol, veh/h	0	0	184	9	2	19	144	728	5	5	838	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	252	12	3	26	197	997	7	7	1148	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1148	2557	2557	1001	1148	0	0	1004	0	0
Stage 1	-	-	-	1395	1395	-	-	-	-	-	-	-
Stage 2	-	-	-	1162	1162	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	~ 240	15	27	291	612	-	-	698	-	-
Stage 1	0	0	-	158	210	-	-	-	-	-	-	-
Stage 2	0	0	-	217	272	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	~ 240	-	18	291	612	-	-	698	-	-
Mov Cap-2 Maneuver	-	-	-	-	18	-	-	-	-	-	-	-
Stage 1	-	-	-	107	142	-	-	-	-	-	-	-
Stage 2	-	-	-	-	269	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	116.3		2.2	0.1
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	612	-	-	240	-	698	-	-
HCM Lane V/C Ratio	0.322	-	-	1.05	-	0.01	-	-
HCM Control Delay (s)	13.7	-	-	116.3	-	10.2	-	-
HCM Lane LOS	B	-	-	F	-	B	-	-
HCM 95th %tile Q(veh)	1.4	-	-	10.5	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	5	17	281	11	11
Future Vol, veh/h	275	5	17	281	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	5	18	305	12	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	644	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	342	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1257	-	437	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	431	738
Mov Cap-2 Maneuver	-	-	-	-	529	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	709	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	616	-	-	1257	-
HCM Lane V/C Ratio	0.039	-	-	0.015	-
HCM Control Delay (s)	11.1	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Project Driveway Option B

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	128	0	95	0	737	100	141	1173	1
Future Volume (vph)	0	0	104	128	0	95	0	737	100	141	1173	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	5.5
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)			1452	1770		1495		4893	1583	1736	3539	1615
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)			1452	1770		1495		4893	1583	1736	3539	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	136	0	101	0	784	106	150	1248	1
RTOR Reduction (vph)	0	0	102	0	0	76	0	0	54	0	0	0
Lane Group Flow (vph)	0	0	9	136	0	25	0	784	52	150	1248	1
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			4.5	5.1		14.1		23.0	28.1	6.3	33.3	33.3
Effective Green, g (s)			4.5	5.1		14.1		23.0	28.1	6.3	33.3	33.3
Actuated g/C Ratio			0.08	0.09		0.25		0.40	0.49	0.11	0.59	0.59
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	5.5
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	4.0
Lane Grp Cap (vph)			114	158		370		1977	781	192	2071	945
v/s Ratio Prot				c0.08				0.16	0.01	c0.09	c0.35	
v/s Ratio Perm			0.01			c0.02			0.03			0.00
v/c Ratio			0.08	0.86		0.07		0.40	0.07	0.78	0.60	0.00
Uniform Delay, d1			24.3	25.5		16.4		12.0	7.5	24.6	7.6	4.9
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2			0.3	35.0		0.1		0.2	0.0	17.1	0.6	0.0
Delay (s)			24.6	60.6		16.5		12.2	7.6	41.7	8.1	4.9
Level of Service			C	E		B		B	A	D	A	A
Approach Delay (s)		24.6			41.8			11.7			11.7	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	24	241	159	42	28	265	804	123	89	1301	95
Future Volume (veh/h)	108	24	241	159	42	28	265	804	123	89	1301	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1789	1900	1743	1845	1863
Adj Flow Rate, veh/h	112	25	251	166	44	29	276	838	128	93	1355	99
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	7	9	3	2
Cap, veh/h	136	224	314	191	280	244	303	2307	350	116	1512	674
Arrive On Green	0.08	0.13	0.13	0.12	0.16	0.16	0.18	0.54	0.54	0.07	0.43	0.43
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	4280	650	1660	3505	1562
Grp Volume(v), veh/h	112	25	251	166	44	29	276	636	330	93	1355	99
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1628	1674	1660	1752	1562
Q Serve(g_s), s	7.8	1.5	11.5	11.5	2.5	1.9	18.4	13.0	13.1	6.4	41.5	4.5
Cycle Q Clear(g_c), s	7.8	1.5	11.5	11.5	2.5	1.9	18.4	13.0	13.1	6.4	41.5	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	136	224	314	191	280	244	303	1755	902	116	1512	674
V/C Ratio(X)	0.82	0.11	0.80	0.87	0.16	0.12	0.91	0.36	0.37	0.80	0.90	0.15
Avail Cap(c_a), veh/h	183	452	635	199	464	406	324	1755	902	208	1575	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	44.6	49.0	50.3	41.7	41.5	46.7	15.3	15.3	53.1	30.5	20.0
Incr Delay (d2), s/veh	19.5	0.2	4.7	30.5	0.3	0.2	27.8	0.3	0.5	12.2	7.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.7	4.1	6.8	1.2	0.8	11.0	5.9	6.2	3.3	21.5	2.0
LnGrp Delay(d),s/veh	71.7	44.8	53.7	80.8	42.0	41.7	74.5	15.5	15.8	65.3	38.0	20.2
LnGrp LOS	E	D	D	F	D	D	E	B	B	E	D	C
Approach Vol, veh/h		388			239			1242			1547	
Approach Delay, s/veh		58.3			68.9			28.7			38.5	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	67.4	17.4	18.8	24.5	54.9	13.6	22.7
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	14.5	59.5	14.0	30.0	22.0	52.0	12.9	31.1
Max Q Clear Time (g_c+I1), s	8.4	15.1	13.5	13.5	20.4	43.5	9.8	4.5
Green Ext Time (p_c), s	0.1	40.0	0.0	1.3	0.1	6.5	0.1	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.3
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	837	1400	4
Future Vol, veh/h	0	0	16	837	1400	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	881	1474	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	739	1478	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	364	462	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	364	462	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	462	-	-	-	-
HCM Lane V/C Ratio	0.036	-	-	-	-
HCM Control Delay (s)	13.1	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	142	58	795	144	56	1344
Future Volume (veh/h)	142	58	795	144	56	1344
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	63	864	157	61	1461
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	346	159	2806	1033	104	2501
Arrive On Green	0.10	0.10	0.55	0.55	0.06	0.71
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	154	63	864	157	61	1461
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	2.0	1.7	4.3	1.8	1.6	9.6
Cycle Q Clear(g_c), s	2.0	1.7	4.3	1.8	1.6	9.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	346	159	2806	1033	104	2501
V/C Ratio(X)	0.44	0.40	0.31	0.15	0.59	0.58
Avail Cap(c_a), veh/h	1327	610	2806	1033	239	2501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	19.7	5.7	3.1	21.4	3.4
Incr Delay (d2), s/veh	0.9	1.6	0.3	0.3	5.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.8	2.1	1.1	0.9	4.8
LnGrp Delay(d),s/veh	20.7	21.3	5.9	3.4	26.6	4.4
LnGrp LOS	C	C	A	A	C	A
Approach Vol, veh/h	217		1021			1522
Approach Delay, s/veh	20.8		5.6			5.3
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	30.3				37.5		9.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	6.3	22.2				33.0		18.0
Max Q Clear Time (g_c+I1), s	3.6	6.3				11.6		4.0
Green Ext Time (p_c), s	0.0	13.4				17.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	241	0	0	223	0	0
Future Vol, veh/h	241	0	0	223	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	262	0	0	242	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	262
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	777
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	777
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	205	0	121	0	1641	191	115	1325	0
Future Volume (vph)	0	0	142	205	0	121	0	1641	191	115	1325	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1597	1770		1553		5085	1615	1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1597	1770		1553		5085	1615	1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	214	0	126	0	1709	199	120	1380	0
RTOR Reduction (vph)	0	0	122	0	0	99	0	0	78	0	0	0
Lane Group Flow (vph)	0	0	26	214	0	27	0	1709	121	120	1380	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			7.4	5.0		16.9		43.6	48.6	6.0	53.6	
Effective Green, g (s)			7.4	5.0		16.9		43.6	48.6	6.0	53.6	
Actuated g/C Ratio			0.09	0.06		0.21		0.55	0.61	0.08	0.67	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			147	110		328		2771	981	134	2371	
v/s Ratio Prot				c0.12				c0.34	0.01	c0.07	0.39	
v/s Ratio Perm			c0.02			0.02			0.07			
v/c Ratio			0.18	1.95		0.08		0.62	0.12	0.90	0.58	
Uniform Delay, d1			33.5	37.5		25.3		12.5	6.7	36.7	7.1	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.6	456.8		0.1		0.5	0.1	46.4	0.4	
Delay (s)			34.1	494.3		25.5		12.9	6.7	83.1	7.6	
Level of Service			C	F		C		B	A	F	A	
Approach Delay (s)		34.1			320.6			12.3			13.6	
Approach LOS		C			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	28	368	137	26	33	358	1822	98	61	1722	124
Future Volume (veh/h)	195	28	368	137	26	33	358	1822	98	61	1722	124
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1900	1863	1863	1881
Adj Flow Rate, veh/h	207	30	391	146	28	35	381	1938	104	65	1832	132
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	171	300	449	166	300	250	301	2821	151	83	1569	699
Arrive On Green	0.09	0.16	0.16	0.09	0.16	0.16	0.17	0.57	0.57	0.05	0.44	0.44
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	4942	264	1774	3539	1577
Grp Volume(v), veh/h	207	30	391	146	28	35	381	1328	714	65	1832	132
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1695	1816	1774	1770	1577
Q Serve(g_s), s	13.0	1.9	19.2	11.3	1.8	2.7	24.0	38.0	38.3	5.0	61.0	7.0
Cycle Q Clear(g_c), s	13.0	1.9	19.2	11.3	1.8	2.7	24.0	38.0	38.3	5.0	61.0	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	171	300	449	166	300	250	301	1935	1037	83	1569	699
V/C Ratio(X)	1.21	0.10	0.87	0.88	0.09	0.14	1.27	0.69	0.69	0.78	1.17	0.19
Avail Cap(c_a), veh/h	171	398	596	166	398	332	301	1935	1037	153	1569	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.3	48.9	56.1	61.5	48.8	49.2	56.8	20.8	20.9	64.9	38.3	23.3
Incr Delay (d2), s/veh	136.8	0.1	10.6	37.9	0.1	0.3	144.1	1.3	2.5	14.6	82.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	1.0	7.9	7.2	0.9	1.2	23.4	18.1	19.8	2.8	47.7	3.1
LnGrp Delay(d),s/veh	199.1	49.0	66.6	99.4	48.9	49.4	200.9	22.2	23.4	79.5	121.0	23.5
LnGrp LOS	F	D	E	F	D	D	F	C	C	E	F	C
Approach Vol, veh/h		628			209			2423			2029	
Approach Delay, s/veh		109.5			84.3			50.6			113.4	
Approach LOS		F			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	83.6	17.0	26.6	28.0	66.0	17.0	26.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	11.9	73.1	13.0	30.0	24.0	61.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	7.0	40.3	13.3	21.2	26.0	63.0	15.0	4.7
Green Ext Time (p_c), s	0.0	32.7	0.0	1.4	0.0	0.0	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	83.0
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1832	1671	2
Future Vol, veh/h	0	20	5	1832	1671	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1889	1723	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	862	1725	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	292	371	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	292	371	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	371	-	292	-	-
HCM Lane V/C Ratio	0.014	-	0.071	-	-
HCM Control Delay (s)	14.8	-	18.3	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	370	167	1676	356	148	1543
Future Volume (veh/h)	370	167	1676	356	148	1543
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	402	182	1822	387	161	1677
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	574	264	2559	1061	202	2439
Arrive On Green	0.17	0.17	0.50	0.50	0.11	0.69
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	402	182	1822	387	161	1677
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	6.9	6.8	17.3	6.7	5.5	17.5
Cycle Q Clear(g_c), s	6.9	6.8	17.3	6.7	5.5	17.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	574	264	2559	1061	202	2439
V/C Ratio(X)	0.70	0.69	0.71	0.36	0.80	0.69
Avail Cap(c_a), veh/h	993	457	2559	1061	242	2439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	24.5	12.0	4.5	27.0	5.7
Incr Delay (d2), s/veh	1.6	3.2	1.7	1.0	14.5	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.2	8.3	4.6	3.5	8.9
LnGrp Delay(d),s/veh	26.1	27.7	13.7	5.5	41.5	7.3
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	584		2209			1838
Approach Delay, s/veh	26.6		12.3			10.3
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.6	35.9				47.5		14.9
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	8.5	30.0				43.0		18.0
Max Q Clear Time (g_c+I1), s	7.5	19.3				19.5		8.9
Green Ext Time (p_c), s	0.0	10.5				22.6		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	299	7	0	326	0	3
Future Vol, veh/h	299	7	0	326	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	325	8	0	354	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	329
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	712
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	712
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	712	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	10.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	227	0	66	0	1430	188	101	1431	0
Future Volume (vph)	0	0	69	227	0	66	0	1430	188	101	1431	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1588	1805		1455		5036	1599	1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1588	1805		1455		5036	1599	1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	236	0	69	0	1490	196	105	1491	0
RTOR Reduction (vph)	0	0	68	0	0	55	0	0	81	0	0	0
Lane Group Flow (vph)	0	0	4	236	0	14	0	1490	115	105	1491	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			3.0	5.1		12.6		30.6	35.7	4.1	38.7	
Effective Green, g (s)			3.0	5.1		12.6		30.6	35.7	4.1	38.7	
Actuated g/C Ratio			0.05	0.08		0.21		0.50	0.59	0.07	0.64	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			78	151		301		2534	938	118	2252	
v/s Ratio Prot				c0.13				0.30	0.01	0.06	c0.42	
v/s Ratio Perm			0.00			c0.01			0.06			
v/c Ratio			0.05	1.56		0.05		0.59	0.12	0.89	0.66	
Uniform Delay, d1			27.5	27.8		19.3		10.7	5.6	28.1	6.9	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2	282.9		0.1		0.4	0.1	48.7	0.8	
Delay (s)			27.8	310.8		19.4		11.1	5.6	76.8	7.8	
Level of Service			C	F		B		B	A	E	A	
Approach Delay (s)		27.8			244.9			10.4			12.3	
Approach LOS		C			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	27	298	174	28	23	301	1619	157	64	1733	139
Future Volume (veh/h)	155	27	298	174	28	23	301	1619	157	64	1733	139
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1864	1900	1845	1863	1881
Adj Flow Rate, veh/h	161	28	310	181	29	24	314	1686	164	67	1805	145
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	1
Cap, veh/h	170	244	373	172	235	216	288	2791	271	85	1679	748
Arrive On Green	0.10	0.13	0.13	0.10	0.13	0.13	0.17	0.59	0.59	0.05	0.47	0.47
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4718	458	1757	3539	1577
Grp Volume(v), veh/h	161	28	310	181	29	24	314	1211	639	67	1805	145
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1697	1783	1757	1770	1577
Q Serve(g_s), s	12.2	1.8	14.4	13.0	1.9	1.7	22.0	30.1	30.3	5.0	63.0	7.1
Cycle Q Clear(g_c), s	12.2	1.8	14.4	13.0	1.9	1.7	22.0	30.1	30.3	5.0	63.0	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	170	244	373	172	235	216	288	2007	1055	85	1679	748
V/C Ratio(X)	0.94	0.11	0.83	1.05	0.12	0.11	1.09	0.60	0.61	0.78	1.07	0.19
Avail Cap(c_a), veh/h	170	413	630	172	398	365	288	2007	1055	161	1679	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.5	50.6	56.0	59.9	50.6	50.6	55.4	17.2	17.2	62.5	34.9	20.2
Incr Delay (d2), s/veh	52.9	0.2	4.8	83.1	0.2	0.2	78.9	0.8	1.5	14.4	45.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.9	5.8	10.2	0.9	0.8	16.8	14.2	15.3	2.8	41.1	3.1
LnGrp Delay(d),s/veh	112.4	50.8	60.9	143.0	50.9	50.8	134.3	18.0	18.7	76.8	80.0	20.5
LnGrp LOS	F	D	E	F	D	D	F	B	B	E	F	C
Approach Vol, veh/h		499			234			2164			2017	
Approach Delay, s/veh		76.9			122.1			35.1			75.6	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	83.5	17.0	21.8	26.0	68.0	17.0	21.8
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	12.2	72.8	13.0	30.0	22.0	63.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	7.0	32.3	15.0	16.4	24.0	65.0	14.2	3.9
Green Ext Time (p_c), s	0.0	40.3	0.0	1.4	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	60.1
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	1618	1727	0
Future Vol, veh/h	0	0	7	1618	1727	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	1668	1780	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	890	1780	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	290	354	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	290	354	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	354	-	-	-	-
HCM Lane V/C Ratio	0.02	-	-	-	-
HCM Control Delay (s)	15.4	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	439	241	1380	465	233	1494
Future Volume (veh/h)	439	241	1380	465	233	1494
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	477	262	1500	505	253	1624
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	722	332	2104	988	304	2312
Arrive On Green	0.21	0.21	0.41	0.41	0.17	0.65
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	477	262	1500	505	253	1624
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	8.4	10.3	16.1	11.6	9.1	19.3
Cycle Q Clear(g_c), s	8.4	10.3	16.1	11.6	9.1	19.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	722	332	2104	988	304	2312
V/C Ratio(X)	0.66	0.79	0.71	0.51	0.83	0.70
Avail Cap(c_a), veh/h	941	433	2104	988	418	2312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	24.6	16.0	6.8	26.4	7.3
Incr Delay (d2), s/veh	1.1	7.1	2.1	1.9	10.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	5.2	7.9	8.4	5.3	9.8
LnGrp Delay(d),s/veh	24.9	31.8	18.1	8.7	36.4	9.1
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	739		2005			1877
Approach Delay, s/veh	27.4		15.8			12.8
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	15.8	31.7				47.5		18.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	15.5	23.0				43.0		18.0
Max Q Clear Time (g_c+I1), s	11.1	18.1				21.3		12.3
Green Ext Time (p_c), s	0.3	4.8				20.5		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	15	0	293	0	6
Future Vol, veh/h	275	15	0	293	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	16	0	318	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	307
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	733
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	733
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	733	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	10	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Project Driveway Option C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	104	126	0	97	0	735	98	141	1173	1
Future Volume (vph)	0	0	104	126	0	97	0	735	98	141	1173	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	5.5
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)			1448	1770		1495		4893	1583	1736	3539	1615
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)			1448	1770		1495		4893	1583	1736	3539	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	111	134	0	103	0	782	104	150	1248	1
RTOR Reduction (vph)	0	0	104	0	0	77	0	0	54	0	0	0
Lane Group Flow (vph)	0	0	7	134	0	26	0	782	50	150	1248	1
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			3.0	4.9		12.4		19.0	23.9	5.1	28.1	28.1
Effective Green, g (s)			3.0	4.9		12.4		19.0	23.9	5.1	28.1	28.1
Actuated g/C Ratio			0.06	0.10		0.25		0.38	0.48	0.10	0.56	0.56
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	5.5
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	4.0
Lane Grp Cap (vph)			86	173		370		1859	756	177	1988	907
v/s Ratio Prot				c0.08				0.16	0.01	c0.09	c0.35	
v/s Ratio Perm			0.00			c0.02			0.02			0.00
v/c Ratio			0.08	0.77		0.07		0.42	0.07	0.85	0.63	0.00
Uniform Delay, d1			22.2	22.0		14.4		11.4	7.0	22.1	7.4	4.8
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2			0.4	19.2		0.1		0.2	0.0	28.4	0.7	0.0
Delay (s)			22.6	41.2		14.5		11.6	7.1	50.5	8.1	4.8
Level of Service			C	D		B		B	A	D	A	A
Approach Delay (s)		22.6			29.6			11.1			12.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

08/19/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	24	241	159	42	28	265	804	123	89	1301	95
Future Volume (veh/h)	108	24	241	159	42	28	265	804	123	89	1301	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1789	1900	1743	1845	1863
Adj Flow Rate, veh/h	112	25	251	166	44	29	276	838	128	93	1355	99
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	7	9	3	2
Cap, veh/h	136	224	314	191	280	244	303	2307	350	116	1512	674
Arrive On Green	0.08	0.13	0.13	0.12	0.16	0.16	0.18	0.54	0.54	0.07	0.43	0.43
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	4280	650	1660	3505	1562
Grp Volume(v), veh/h	112	25	251	166	44	29	276	636	330	93	1355	99
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1628	1674	1660	1752	1562
Q Serve(g_s), s	7.8	1.5	11.5	11.5	2.5	1.9	18.4	13.0	13.1	6.4	41.5	4.5
Cycle Q Clear(g_c), s	7.8	1.5	11.5	11.5	2.5	1.9	18.4	13.0	13.1	6.4	41.5	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	136	224	314	191	280	244	303	1755	902	116	1512	674
V/C Ratio(X)	0.82	0.11	0.80	0.87	0.16	0.12	0.91	0.36	0.37	0.80	0.90	0.15
Avail Cap(c_a), veh/h	183	452	635	199	464	406	324	1755	902	208	1575	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	44.6	49.0	50.3	41.7	41.5	46.7	15.3	15.3	53.1	30.5	20.0
Incr Delay (d2), s/veh	19.5	0.2	4.7	30.5	0.3	0.2	27.8	0.3	0.5	12.2	7.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.7	4.1	6.8	1.2	0.8	11.0	5.9	6.2	3.3	21.5	2.0
LnGrp Delay(d),s/veh	71.7	44.8	53.7	80.8	42.0	41.7	74.5	15.5	15.8	65.3	38.0	20.2
LnGrp LOS	E	D	D	F	D	D	E	B	B	E	D	C
Approach Vol, veh/h		388			239			1242			1547	
Approach Delay, s/veh		58.3			68.9			28.7			38.5	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	67.4	17.4	18.8	24.5	54.9	13.6	22.7
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	14.5	59.5	14.0	30.0	22.0	52.0	12.9	31.1
Max Q Clear Time (g_c+I1), s	8.4	15.1	13.5	13.5	20.4	43.5	9.8	4.5
Green Ext Time (p_c), s	0.1	40.0	0.0	1.3	0.1	6.5	0.1	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.3
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	16	833	1398	4
Future Vol, veh/h	0	0	16	833	1398	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	17	877	1472	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	738	1476	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	365	462	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	365	462	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	462	-	-	-	-
HCM Lane V/C Ratio	0.036	-	-	-	-
HCM Control Delay (s)	13.1	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	142	54	795	144	54	1344
Future Volume (veh/h)	142	54	795	144	54	1344
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	59	864	157	59	1461
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	345	159	2813	1035	102	2502
Arrive On Green	0.10	0.10	0.55	0.55	0.06	0.71
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	154	59	864	157	59	1461
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	2.0	1.6	4.3	1.8	1.5	9.6
Cycle Q Clear(g_c), s	2.0	1.6	4.3	1.8	1.5	9.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	345	159	2813	1035	102	2502
V/C Ratio(X)	0.45	0.37	0.31	0.15	0.58	0.58
Avail Cap(c_a), veh/h	1327	610	2813	1035	239	2502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	19.6	5.6	3.1	21.5	3.4
Incr Delay (d2), s/veh	0.9	1.4	0.3	0.3	5.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.8	2.0	1.1	0.9	4.8
LnGrp Delay(d),s/veh	20.7	21.1	5.9	3.4	26.6	4.4
LnGrp LOS	C	C	A	A	C	A
Approach Vol, veh/h	213		1021			1520
Approach Delay, s/veh	20.8		5.5			5.3
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.2	30.3				37.5		9.2
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	6.3	22.2				33.0		18.0
Max Q Clear Time (g_c+I1), s	3.5	6.3				11.6		4.0
Green Ext Time (p_c), s	0.0	13.4				17.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	239	0	0	223	0	0
Future Vol, veh/h	239	0	0	223	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	0	0	242	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	260
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	779
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	779
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	239	1	3	223	5	5
Future Vol, veh/h	239	1	3	223	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	1	3	242	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	261	0	509	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	249	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1303	-	524	779
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1303	-	523	779
Mov Cap-2 Maneuver	-	-	-	-	598	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	677	-	-	1303	-
HCM Lane V/C Ratio	0.016	-	-	0.003	-
HCM Control Delay (s)	10.4	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	142	199	0	124	0	1638	188	115	1325	0
Future Volume (vph)	0	0	142	199	0	124	0	1638	188	115	1325	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1583	1770		1553		5085	1615	1787	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1583	1770		1553		5085	1615	1787	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	148	207	0	129	0	1706	196	120	1380	0
RTOR Reduction (vph)	0	0	142	0	0	93	0	0	84	0	0	0
Lane Group Flow (vph)	0	0	6	207	0	36	0	1706	112	120	1380	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			2.3	9.4		16.2		24.2	33.6	4.9	33.1	
Effective Green, g (s)			2.3	9.4		16.2		24.2	33.6	4.9	33.1	
Actuated g/C Ratio			0.04	0.16		0.28		0.41	0.57	0.08	0.56	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			61	282		427		2092	922	148	1992	
v/s Ratio Prot				c0.12				c0.34	0.02	0.07	c0.39	
v/s Ratio Perm			0.00			c0.02			0.05			
v/c Ratio			0.09	0.73		0.08		0.82	0.12	0.81	0.69	
Uniform Delay, d1			27.2	23.5		15.8		15.3	5.8	26.5	9.2	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.7	9.5		0.1		2.7	0.1	26.2	1.1	
Delay (s)			27.9	33.0		15.9		18.0	5.9	52.7	10.4	
Level of Service			C	C		B		B	A	D	B	
Approach Delay (s)		27.9			26.4			16.8			13.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	28	368	137	26	33	358	1822	98	61	1722	124
Future Volume (veh/h)	195	28	368	137	26	33	358	1822	98	61	1722	124
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1900	1863	1863	1881
Adj Flow Rate, veh/h	207	30	391	146	28	35	381	1938	104	65	1832	132
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	171	300	449	166	300	250	301	2821	151	83	1569	699
Arrive On Green	0.09	0.16	0.16	0.09	0.16	0.16	0.17	0.57	0.57	0.05	0.44	0.44
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	4942	264	1774	3539	1577
Grp Volume(v), veh/h	207	30	391	146	28	35	381	1328	714	65	1832	132
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1695	1816	1774	1770	1577
Q Serve(g_s), s	13.0	1.9	19.2	11.3	1.8	2.7	24.0	38.0	38.3	5.0	61.0	7.0
Cycle Q Clear(g_c), s	13.0	1.9	19.2	11.3	1.8	2.7	24.0	38.0	38.3	5.0	61.0	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	171	300	449	166	300	250	301	1935	1037	83	1569	699
V/C Ratio(X)	1.21	0.10	0.87	0.88	0.09	0.14	1.27	0.69	0.69	0.78	1.17	0.19
Avail Cap(c_a), veh/h	171	398	596	166	398	332	301	1935	1037	153	1569	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.3	48.9	56.1	61.5	48.8	49.2	56.8	20.8	20.9	64.9	38.3	23.3
Incr Delay (d2), s/veh	136.8	0.1	10.6	37.9	0.1	0.3	144.1	1.3	2.5	14.6	82.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	1.0	7.9	7.2	0.9	1.2	23.4	18.1	19.8	2.8	47.7	3.1
LnGrp Delay(d),s/veh	199.1	49.0	66.6	99.4	48.9	49.4	200.9	22.2	23.4	79.5	121.0	23.5
LnGrp LOS	F	D	E	F	D	D	F	C	C	E	F	C
Approach Vol, veh/h		628			209			2423			2029	
Approach Delay, s/veh		109.5			84.3			50.6			113.4	
Approach LOS		F			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	83.6	17.0	26.6	28.0	66.0	17.0	26.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	11.9	73.1	13.0	30.0	24.0	61.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	7.0	40.3	13.3	21.2	26.0	63.0	15.0	4.7
Green Ext Time (p_c), s	0.0	32.7	0.0	1.4	0.0	0.0	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	83.0
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	1826	1665	2
Future Vol, veh/h	0	20	5	1826	1665	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	1882	1716	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	859	1718	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.35	2.2	-	-	-
Pot Cap-1 Maneuver	0	294	374	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	294	374	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	374	-	294	-	-
HCM Lane V/C Ratio	0.014	-	0.07	-	-
HCM Control Delay (s)	14.8	-	18.2	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	370	161	1676	356	142	1543
Future Volume (veh/h)	370	161	1676	356	142	1543
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	402	175	1822	387	154	1677
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	593	273	2442	1033	195	2369
Arrive On Green	0.17	0.17	0.48	0.48	0.11	0.67
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	402	175	1822	387	154	1677
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	6.2	5.8	16.5	6.4	4.8	16.9
Cycle Q Clear(g_c), s	6.2	5.8	16.5	6.4	4.8	16.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	593	273	2442	1033	195	2369
V/C Ratio(X)	0.68	0.64	0.75	0.37	0.79	0.71
Avail Cap(c_a), veh/h	1091	502	2442	1033	234	2369
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	21.9	11.9	4.5	24.6	5.9
Incr Delay (d2), s/veh	1.4	2.5	2.1	1.0	14.1	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.7	8.1	4.4	3.1	8.5
LnGrp Delay(d),s/veh	23.4	24.4	14.1	5.6	38.7	7.7
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	577		2209			1831
Approach Delay, s/veh	23.7		12.6			10.3
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.7	31.8				42.5		14.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	7.5	26.0				38.0		18.0
Max Q Clear Time (g_c+I1), s	6.8	18.5				18.9		8.2
Green Ext Time (p_c), s	0.0	7.4				18.5		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	296	7	0	323	0	3
Future Vol, veh/h	296	7	0	323	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	322	8	0	351	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	326
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	715
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	715
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	715	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-
HCM Control Delay (s)	10.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	299	5	11	320	6	6
Future Vol, veh/h	299	5	11	320	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	325	5	12	348	7	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	330	0	700	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1229	-	405	713
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1229	-	401	713
Mov Cap-2 Maneuver	-	-	-	-	506	-
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	592	-	-	1229	-
HCM Lane V/C Ratio	0.022	-	-	0.01	-
HCM Control Delay (s)	11.2	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	69	215	0	72	0	1424	182	101	1431	0
Future Volume (vph)	0	0	69	215	0	72	0	1424	182	101	1431	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.95	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1577	1805		1455		5036	1599	1752	3539	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1577	1805		1455		5036	1599	1752	3539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	72	224	0	75	0	1483	190	105	1491	0
RTOR Reduction (vph)	0	0	70	0	0	55	0	0	79	0	0	0
Lane Group Flow (vph)	0	0	2	224	0	20	0	1483	111	105	1491	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	Perm
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			2
Actuated Green, G (s)			1.7	8.5		14.7		23.3	31.8	3.1	30.4	
Effective Green, g (s)			1.7	8.5		14.7		23.3	31.8	3.1	30.4	
Actuated g/C Ratio			0.03	0.16		0.27		0.43	0.58	0.06	0.56	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			49	280		391		2149	931	99	1970	
v/s Ratio Prot				c0.12				0.29	0.02	0.06	c0.42	
v/s Ratio Perm			0.00			c0.01			0.05			
v/c Ratio			0.05	0.80		0.05		0.69	0.12	1.06	0.76	
Uniform Delay, d1			25.7	22.2		14.8		12.7	5.1	25.8	9.3	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.4	15.0		0.1		1.0	0.1	107.8	1.8	
Delay (s)			26.1	37.2		14.9		13.8	5.2	133.5	11.1	
Level of Service			C	D		B		B	A	F	B	
Approach Delay (s)		26.1			31.6			12.8			19.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	27	298	174	28	23	301	1619	157	64	1733	139
Future Volume (veh/h)	155	27	298	174	28	23	301	1619	157	64	1733	139
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1864	1900	1845	1863	1881
Adj Flow Rate, veh/h	161	28	310	181	29	24	314	1686	164	67	1805	145
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	1
Cap, veh/h	170	244	373	172	235	216	288	2791	271	85	1679	748
Arrive On Green	0.10	0.13	0.13	0.10	0.13	0.13	0.17	0.59	0.59	0.05	0.47	0.47
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4718	458	1757	3539	1577
Grp Volume(v), veh/h	161	28	310	181	29	24	314	1211	639	67	1805	145
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1697	1783	1757	1770	1577
Q Serve(g_s), s	12.2	1.8	14.4	13.0	1.9	1.7	22.0	30.1	30.3	5.0	63.0	7.1
Cycle Q Clear(g_c), s	12.2	1.8	14.4	13.0	1.9	1.7	22.0	30.1	30.3	5.0	63.0	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	170	244	373	172	235	216	288	2007	1055	85	1679	748
V/C Ratio(X)	0.94	0.11	0.83	1.05	0.12	0.11	1.09	0.60	0.61	0.78	1.07	0.19
Avail Cap(c_a), veh/h	170	413	630	172	398	365	288	2007	1055	161	1679	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.5	50.6	56.0	59.9	50.6	50.6	55.4	17.2	17.3	62.5	34.9	20.2
Incr Delay (d2), s/veh	52.9	0.2	4.8	83.1	0.2	0.2	78.9	0.8	1.5	14.4	45.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.9	5.8	10.2	0.9	0.8	16.8	14.2	15.3	2.8	41.1	3.1
LnGrp Delay(d),s/veh	112.4	50.8	60.9	143.0	50.9	50.8	134.3	18.0	18.7	76.8	80.0	20.5
LnGrp LOS	F	D	E	F	D	D	F	B	B	E	F	C
Approach Vol, veh/h		499			234			2164			2017	
Approach Delay, s/veh		76.9			122.1			35.1			75.6	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	83.5	17.0	21.8	26.0	68.0	17.0	21.8
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	12.2	72.8	13.0	30.0	22.0	63.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	7.0	32.3	15.0	16.4	24.0	65.0	14.2	3.9
Green Ext Time (p_c), s	0.0	40.3	0.0	1.4	0.0	0.0	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	60.1
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	1606	1715	0
Future Vol, veh/h	0	0	7	1606	1715	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	7	1656	1768	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	884	1768	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	4.1	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	0	292	357	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	292	357	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	357	-	-	-	-
HCM Lane V/C Ratio	0.02	-	-	-	-
HCM Control Delay (s)	15.3	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	439	229	1380	465	221	1494
Future Volume (veh/h)	439	229	1380	465	221	1494
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	477	249	1500	505	240	1624
Adj No. of Lanes	2	1	3	1	1	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	723	332	2033	965	290	2261
Arrive On Green	0.21	0.21	0.40	0.40	0.16	0.64
Sat Flow, veh/h	3442	1583	5253	1583	1774	3632
Grp Volume(v), veh/h	477	249	1500	505	240	1624
Grp Sat Flow(s),veh/h/ln	1721	1583	1695	1583	1774	1770
Q Serve(g_s), s	7.6	8.8	14.9	10.9	7.8	18.2
Cycle Q Clear(g_c), s	7.6	8.8	14.9	10.9	7.8	18.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	723	332	2033	965	290	2261
V/C Ratio(X)	0.66	0.75	0.74	0.52	0.83	0.72
Avail Cap(c_a), veh/h	1041	479	2033	965	343	2261
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	22.0	15.2	6.7	24.1	7.2
Incr Delay (d2), s/veh	1.0	3.9	2.4	2.0	13.5	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	4.2	7.4	7.8	4.9	9.2
LnGrp Delay(d),s/veh	22.6	25.9	17.6	8.7	37.5	9.2
LnGrp LOS	C	C	B	A	D	A
Approach Vol, veh/h	726		2005			1864
Approach Delay, s/veh	23.7		15.4			12.8
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.2	28.3				42.5		17.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	11.5	22.0				38.0		18.0
Max Q Clear Time (g_c+I1), s	9.8	16.9				20.2		10.8
Green Ext Time (p_c), s	0.1	5.0				16.9		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	269	15	0	287	0	6
Future Vol, veh/h	269	15	0	287	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	292	16	0	312	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	300
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	740
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	740
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	740	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-
HCM Control Delay (s)	9.9	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	5	17	281	11	11
Future Vol, veh/h	275	5	17	281	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	5	18	305	12	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	644	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	342	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1257	-	437	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	431	738
Mov Cap-2 Maneuver	-	-	-	-	529	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	709	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	616	-	-	1257	-
HCM Lane V/C Ratio	0.039	-	-	0.015	-
HCM Control Delay (s)	11.1	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Cumulative Conditions – Long Term Baseline

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	130	305	235	190	145	255	480	95	70	615	195
Future Volume (veh/h)	160	130	305	235	190	145	255	480	95	70	615	195
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1727	1727	1827	1840	1900	1827	1863	1863	1900	1818	1900
Adj Flow Rate, veh/h	184	149	351	270	218	167	293	552	109	80	707	224
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	10	10	4	5	5	4	2	2	0	5	5
Cap, veh/h	378	372	309	375	207	159	288	706	591	101	677	215
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.38	0.38	0.06	0.27	0.27
Sat Flow, veh/h	1757	1727	1433	1740	963	737	1740	1863	1560	1810	2552	809
Grp Volume(v), veh/h	184	149	351	270	0	385	293	552	109	80	478	453
Grp Sat Flow(s),veh/h/ln	1757	1727	1433	1740	0	1700	1740	1863	1560	1810	1727	1634
Q Serve(g_s), s	11.9	9.6	28.0	18.7	0.0	28.0	21.5	34.0	6.1	5.7	34.5	34.5
Cycle Q Clear(g_c), s	11.9	9.6	28.0	18.7	0.0	28.0	21.5	34.0	6.1	5.7	34.5	34.5
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	378	372	309	375	0	366	288	706	591	101	458	434
V/C Ratio(X)	0.49	0.40	1.14	0.72	0.00	1.05	1.02	0.78	0.18	0.79	1.04	1.04
Avail Cap(c_a), veh/h	378	372	309	375	0	366	288	706	591	111	458	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	43.8	51.0	47.4	0.0	51.0	54.3	35.6	27.0	60.6	47.8	47.8
Incr Delay (d2), s/veh	0.4	0.3	93.6	5.8	0.0	61.2	57.8	5.2	0.1	25.7	53.9	55.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	4.6	19.1	9.6	0.0	19.3	14.9	18.5	2.6	3.6	23.3	22.2
LnGrp Delay(d),s/veh	45.1	44.1	144.6	53.1	0.0	112.2	112.1	40.9	27.0	86.4	101.7	102.9
LnGrp LOS	D	D	F	D		F	F	D	C	F	F	F
Approach Vol, veh/h		684			655			954			1011	
Approach Delay, s/veh		95.9			87.8			61.2			101.0	
Approach LOS		F			F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.3	54.7		32.0	26.0	40.0		32.0
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	8.0	48.5		28.0	21.5	34.5		28.0
Max Q Clear Time (g_c+I1), s	7.7	36.0		30.0	23.5	36.5		30.0
Green Ext Time (p_c), s	0.0	5.7		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	85.8
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	10	5	5	5	425	0	480	5	535	775	10
Future Volume (veh/h)	55	10	5	5	5	425	0	480	5	535	775	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1658	1900	1900	1900	1827	1900	1827	1827	1827	1794	1900
Adj Flow Rate, veh/h	59	11	5	5	5	457	0	516	5	575	833	11
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	4	0	4	4	4	6	6
Cap, veh/h	221	37	13	218	200	864	2	557	467	604	1233	16
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.00	0.30	0.30	0.35	0.70	0.70
Sat Flow, veh/h	699	176	62	745	953	1545	1810	1827	1533	1740	1766	23
Grp Volume(v), veh/h	75	0	0	10	0	457	0	516	5	575	0	844
Grp Sat Flow(s),veh/h/ln	937	0	0	1698	0	1545	1810	1827	1533	1740	0	1789
Q Serve(g_s), s	5.1	0.0	0.0	0.0	0.0	16.2	0.0	23.8	0.2	28.0	0.0	23.5
Cycle Q Clear(g_c), s	5.7	0.0	0.0	0.4	0.0	16.2	0.0	23.8	0.2	28.0	0.0	23.5
Prop In Lane	0.79		0.07	0.50		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	271	0	0	418	0	864	2	557	467	604	0	1249
V/C Ratio(X)	0.28	0.00	0.00	0.02	0.00	0.53	0.00	0.93	0.01	0.95	0.00	0.68
Avail Cap(c_a), veh/h	273	0	0	423	0	868	114	598	502	620	0	1249
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	0.0	27.3	0.0	12.1	0.0	29.3	21.1	27.7	0.0	7.5
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.0	0.0	0.6	0.0	19.9	0.0	24.3	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.2	0.0	6.9	0.0	15.1	0.1	17.5	0.0	11.8
LnGrp Delay(d),s/veh	29.8	0.0	0.0	27.3	0.0	12.7	0.0	49.2	21.1	52.0	0.0	9.0
LnGrp LOS	C			C		B		D	C	D		A
Approach Vol, veh/h		75			467			521			1419	
Approach Delay, s/veh		29.8			13.0			49.0			26.4	
Approach LOS		C			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	34.2	30.5		22.3	0.0	64.8		22.3
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	31.0	28.5		18.5	5.5	54.0		18.5
Max Q Clear Time (g_c+I1), s	30.0	25.8		7.7	0.0	25.5		18.2
Green Ext Time (p_c), s	0.2	0.7		1.8	0.0	12.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	25	60	30	55	20	280	480	90	30	100	620
Future Volume (veh/h)	30	25	60	30	55	20	280	480	90	30	100	620
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1849	1845	1863	1795	1900	1863	1838	1900	1900	1810	1810
Adj Flow Rate, veh/h	33	27	66	33	60	22	308	527	99	33	110	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	3	2	8	8	2	4	4	0	5	5
Cap, veh/h	112	92	178	193	136	50	382	1113	208	70	365	310
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.22	0.38	0.38	0.04	0.20	0.00
Sat Flow, veh/h	990	810	1568	1774	1254	460	1774	2938	550	1810	1810	1538
Grp Volume(v), veh/h	60	0	66	33	0	82	308	312	314	33	110	0
Grp Sat Flow(s),veh/h/ln	1800	0	1568	1774	0	1714	1774	1746	1741	1810	1810	1538
Q Serve(g_s), s	1.2	0.0	1.5	0.7	0.0	1.8	6.5	5.4	5.4	0.7	2.0	0.0
Cycle Q Clear(g_c), s	1.2	0.0	1.5	0.7	0.0	1.8	6.5	5.4	5.4	0.7	2.0	0.0
Prop In Lane	0.55		1.00	1.00		0.27	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	204	0	178	193	0	186	382	661	660	70	365	310
V/C Ratio(X)	0.29	0.00	0.37	0.17	0.00	0.44	0.81	0.47	0.48	0.47	0.30	0.00
Avail Cap(c_a), veh/h	1089	0	949	823	0	795	895	1620	1616	297	1063	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.1	0.0	16.3	16.1	0.0	16.5	14.8	9.3	9.3	18.7	13.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.5	0.2	0.0	0.6	1.5	0.3	0.3	1.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.7	0.3	0.0	0.9	3.3	2.6	2.6	0.4	1.0	0.0
LnGrp Delay(d),s/veh	16.4	0.0	16.7	16.2	0.0	17.2	16.3	9.6	9.6	20.5	13.7	0.0
LnGrp LOS	B		B	B		B	B	A	A	C	B	
Approach Vol, veh/h		126			115			934			143	
Approach Delay, s/veh		16.6			16.9			11.8			15.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	18.7		8.0	11.5	11.7		8.4
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	36.8		24.0	20.0	23.3		18.4
Max Q Clear Time (g_c+I1), s	2.7	7.4		3.5	8.5	4.0		3.8
Green Ext Time (p_c), s	0.0	3.5		0.2	0.3	3.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	80.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	205	310	540	120	35	155
Future Vol, veh/h	205	310	540	120	35	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	3	6	10	2
Mvmt Flow	225	341	593	132	38	170

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	840	593	0	0	593	0
Stage 1	593	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.29	-
Pot Cap-1 Maneuver	335	502	-	-	945	-
Stage 1	552	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	320	502	-	-	945	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	213.9	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	409	945	-
HCM Lane V/C Ratio	-	-	1.384	0.041	-
HCM Control Delay (s)	-	-	213.9	9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	27.4	0.1	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	15	110	385	45	35
Future Vol, veh/h	85	15	110	385	45	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	9	7	3	18	6
Mvmt Flow	97	17	125	438	51	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	793	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	688	-
Critical Hdwy	-	-	4.17	-	6.58	6.26
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.263	-	3.662	3.354
Pot Cap-1 Maneuver	-	-	1445	-	336	939
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	471	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1445	-	298	939
Mov Cap-2 Maneuver	-	-	-	-	298	-
Stage 1	-	-	-	-	881	-
Stage 2	-	-	-	-	417	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	425	-	-	1445	-
HCM Lane V/C Ratio	0.214	-	-	0.087	-
HCM Control Delay (s)	15.8	-	-	7.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	110	75	460	355	65	220	660	205	60	1490	250
Future Volume (veh/h)	85	110	75	460	355	65	220	660	205	60	1490	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1743	1863	1743	1810	1727	1792	1810	1827	1863	1881
Adj Flow Rate, veh/h	90	117	80	489	378	69	234	702	218	64	1585	266
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	9	2	9	5	10	6	5	4	2	1
Cap, veh/h	104	279	231	473	405	352	226	1792	1021	81	1541	794
Arrive On Green	0.06	0.16	0.16	0.14	0.23	0.23	0.14	0.53	0.53	0.05	0.44	0.44
Sat Flow, veh/h	1707	1792	1482	3442	1743	1518	1645	3406	1538	1740	3539	1599
Grp Volume(v), veh/h	90	117	80	489	378	69	234	702	218	64	1585	266
Grp Sat Flow(s),veh/h/ln	1707	1792	1482	1721	1743	1518	1645	1703	1538	1740	1770	1599
Q Serve(g_s), s	7.8	8.8	7.2	20.5	31.7	5.5	20.5	18.4	8.3	5.4	65.0	15.0
Cycle Q Clear(g_c), s	7.8	8.8	7.2	20.5	31.7	5.5	20.5	18.4	8.3	5.4	65.0	15.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	104	279	231	473	405	352	226	1792	1021	81	1541	794
V/C Ratio(X)	0.86	0.42	0.35	1.03	0.93	0.20	1.04	0.39	0.21	0.79	1.03	0.34
Avail Cap(c_a), veh/h	104	288	238	473	413	360	226	1792	1021	141	1541	794
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.5	56.9	56.2	64.4	56.2	46.1	64.4	21.1	9.8	70.4	42.1	22.7
Incr Delay (d2), s/veh	48.5	2.1	1.9	50.6	29.0	0.6	69.5	0.3	0.2	15.5	30.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	4.5	3.1	13.0	18.6	2.3	13.6	8.7	3.6	3.0	38.2	6.7
LnGrp Delay(d),s/veh	117.9	59.0	58.1	114.9	85.1	46.7	133.9	21.4	10.1	86.0	72.6	23.2
LnGrp LOS	F	E	E	F	F	D	F	C	B	F	F	C
Approach Vol, veh/h		287			936			1154			1915	
Approach Delay, s/veh		77.3			97.9			42.1			66.2	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	84.1	25.0	28.8	25.0	70.5	13.6	40.2
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.1	73.4	20.5	24.0	20.5	65.0	9.1	35.4
Max Q Clear Time (g_c+I1), s	7.4	20.4	22.5	10.8	22.5	67.0	9.8	33.7
Green Ext Time (p_c), s	0.0	49.4	0.0	5.2	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	67.3
HCM 2010 LOS	E

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	65	295	0	220	0	840	25	80	1860	55
Future Volume (vph)	0	0	65	295	0	220	0	840	25	80	1860	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.91	
Frpb, ped/bikes			0.99	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		1.00		1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1459	1765		1495		3394		1736	5066	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1459	1765		1495		3394		1736	5066	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	69	314	0	234	0	894	27	85	1979	59
RTOR Reduction (vph)	0	0	52	0	0	177	0	3	0	0	5	0
Lane Group Flow (vph)	0	0	17	314	0	57	0	918	0	85	2033	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	
Protected Phases								6		5	2	
Permitted Phases			4	8		8						
Actuated Green, G (s)			14.5	14.5		14.5		27.5		3.9	35.4	
Effective Green, g (s)			14.5	14.5		14.5		27.5		3.9	35.4	
Actuated g/C Ratio			0.24	0.24		0.24		0.46		0.07	0.60	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			356	430		364		1571		113	3019	
v/s Ratio Prot								0.27		0.05	c0.40	
v/s Ratio Perm			0.01	c0.18		0.04						
v/c Ratio			0.05	0.73		0.16		0.58		0.75	0.67	
Uniform Delay, d1			17.2	20.7		17.6		11.7		27.3	8.1	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			0.1	6.7		0.3		0.7		21.8	0.7	
Delay (s)			17.2	27.3		17.9		12.4		49.1	8.8	
Level of Service			B	C		B		B		D	A	
Approach Delay (s)		17.2			23.3			12.4			10.4	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	10	125	160	30	25	350	895	90	80	1850	145
Future Volume (veh/h)	70	10	125	160	30	25	350	895	90	80	1850	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1776	1881	1743	1845	1863
Adj Flow Rate, veh/h	73	10	130	167	31	26	365	932	94	83	1927	151
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	1	9	3	2
Cap, veh/h	92	129	182	191	233	204	392	2039	965	104	2202	683
Arrive On Green	0.06	0.07	0.07	0.12	0.13	0.13	0.23	0.60	0.60	0.06	0.44	0.44
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	3374	1598	1660	5036	1562
Grp Volume(v), veh/h	73	10	130	167	31	26	365	932	94	83	1927	151
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1687	1598	1660	1679	1562
Q Serve(g_s), s	5.2	0.6	6.2	11.9	1.9	1.8	25.0	18.0	2.9	5.9	41.6	7.2
Cycle Q Clear(g_c), s	5.2	0.6	6.2	11.9	1.9	1.8	25.0	18.0	2.9	5.9	41.6	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	92	129	182	191	233	204	392	2039	965	104	2202	683
V/C Ratio(X)	0.80	0.08	0.71	0.87	0.13	0.13	0.93	0.46	0.10	0.80	0.88	0.22
Avail Cap(c_a), veh/h	186	439	617	200	449	393	430	2039	965	198	2261	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	51.4	53.9	51.8	45.4	45.4	45.0	12.9	9.9	55.1	30.6	20.9
Incr Delay (d2), s/veh	14.4	0.3	5.1	30.9	0.3	0.3	26.0	0.3	0.1	13.1	4.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.3	2.2	7.1	0.9	0.8	14.6	8.4	1.3	3.1	20.2	3.2
LnGrp Delay(d),s/veh	70.0	51.6	59.1	82.7	45.7	45.7	71.0	13.2	10.0	68.2	35.0	21.2
LnGrp LOS	E	D	E	F	D	D	E	B	B	E	D	C
Approach Vol, veh/h		213			224			1391			2161	
Approach Delay, s/veh		62.5			73.3			28.2			35.3	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	77.0	17.9	12.8	31.3	57.1	10.6	20.1
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	14.2	69.3	14.5	30.0	30.0	53.5	13.5	31.0
Max Q Clear Time (g_c+I1), s	7.9	20.0	13.9	8.2	27.0	43.6	7.2	3.9
Green Ext Time (p_c), s	0.1	47.7	0.0	0.8	0.4	8.5	0.1	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	36.4
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	65	735	55	340	80	990	150	0	2085	50
Future Volume (veh/h)	5	0	65	735	55	340	80	990	150	0	2085	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1759	1845	1799	1776	1827	1792	1681	0	1696	1900
Adj Flow Rate, veh/h	5	0	71	799	0	410	87	1076	163	0	2266	54
Adj No. of Lanes	1	0	1	2	0	2	1	3	1	0	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	8	3	2	7	4	6	13	0	12	0
Cap, veh/h	11	0	0	847	0	606	247	3341	976	0	2308	805
Arrive On Green	0.01	0.00	0.00	0.24	0.00	0.20	0.28	1.00	1.00	0.00	0.50	0.50
Sat Flow, veh/h	1810	5		3514	0	3019	1740	4893	1429	0	4784	1615
Grp Volume(v), veh/h	5	81.9		799	0	410	87	1076	163	0	2266	54
Grp Sat Flow(s),veh/h/ln	1810	F		1757	0	1509	1740	1631	1429	0	1544	1615
Q Serve(g_s), s	0.4			32.6	0.0	18.3	5.8	0.0	0.0	0.0	70.2	2.1
Cycle Q Clear(g_c), s	0.4			32.6	0.0	18.3	5.8	0.0	0.0	0.0	70.2	2.1
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	11			847	0	606	247	3341	976	0	2308	805
V/C Ratio(X)	0.44			0.94	0.00	0.68	0.35	0.32	0.17	0.00	0.98	0.07
Avail Cap(c_a), veh/h	62			1179	0	806	247	3341	976	0	2312	806
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.41	0.41
Uniform Delay (d), s/veh	72.3			54.4	0.0	54.0	46.9	0.0	0.0	0.0	36.0	13.4
Incr Delay (d2), s/veh	9.6			10.2	0.0	0.6	0.3	0.3	0.4	0.0	8.5	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2			17.1	0.0	7.7	2.8	0.1	0.1	0.0	31.6	1.0
LnGrp Delay(d),s/veh	81.9			64.6	0.0	54.6	47.3	0.3	0.4	0.0	44.5	13.5
LnGrp LOS	F			E		D	D	A	A		D	B
Approach Vol, veh/h					1209			1326			2320	
Approach Delay, s/veh					61.2			3.4			43.7	
Approach LOS					E			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		105.9	40.1		26.9	79.0	5.5	34.6
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		85.9	49.0		8.3	* 73	5.0	39.0
Max Q Clear Time (g_c+I1), s		2.0	34.6		7.8	72.2	2.4	20.3
Green Ext Time (p_c), s		3.5	0.6		0.0	0.6	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	37.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	505	115	425	15	0	30	0	1165	35	220	1980	170
Future Volume (veh/h)	505	115	425	15	0	30	0	1165	35	220	1980	170
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1845	1776	1845	0	1863	0	1667	1792	1863	1863	1743
Adj Flow Rate, veh/h	549	125	462	16	0	33	0	1266	38	239	2152	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	3	7	3	0	2	0	14	6	2	2	9
Cap, veh/h	1108	1008	434	32	0	0	0	2724	724	281	2082	872
Arrive On Green	0.34	0.29	0.29	0.02	0.00	0.00	0.00	0.48	0.48	0.16	1.00	0.00
Sat Flow, veh/h	3281	3505	1509	1757	16		0	5967	1524	3442	3539	1482
Grp Volume(v), veh/h	549	125	462	16	75.2		0	1266	38	239	2152	0
Grp Sat Flow(s),veh/h/ln	1640	1752	1509	1757	E		0	1433	1524	1721	1770	1482
Q Serve(g_s), s	19.4	3.8	42.0	1.3			0.0	21.7	1.6	9.8	85.9	0.0
Cycle Q Clear(g_c), s	19.4	3.8	42.0	1.3			0.0	21.7	1.6	9.8	85.9	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1108	1008	434	32			0	2724	724	281	2082	872
V/C Ratio(X)	0.50	0.12	1.06	0.49			0.00	0.46	0.05	0.85	1.03	0.00
Avail Cap(c_a), veh/h	1108	1008	434	84			0	2724	724	389	2082	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.5	38.4	52.0	71.0			0.0	25.8	14.0	60.2	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	61.2	4.2			0.0	0.5	0.1	9.2	28.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	1.9	24.9	0.7			0.0	8.7	0.7	5.0	8.4	0.0
LnGrp Delay(d),s/veh	38.7	38.4	113.2	75.2			0.0	26.4	14.1	69.4	28.9	0.0
LnGrp LOS	D	D	F	E				C	B	E	F	
Approach Vol, veh/h		1136						1304			2391	
Approach Delay, s/veh		69.0						26.0			33.0	
Approach LOS		E						C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	16.5	75.6	7.3	46.6		92.1	53.9	
Change Period (Y+Rc), s	4.6	6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	16.5	60.5	7.0	42.0		81.6	33.7	
Max Q Clear Time (g_c+I1), s	11.8	23.7	3.3	44.0		87.9	21.4	
Green Ext Time (p_c), s	0.1	19.8	0.0	0.0		0.0	1.3	

Intersection Summary	
HCM 2010 Ctrl Delay	39.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	5	65	15	5	70	60	1000	20	0	2235	185
Future Volume (veh/h)	130	5	65	15	5	70	60	1000	20	0	2235	185
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1891	1532	1863	1776	1900	0	1810	1863
Adj Flow Rate, veh/h	141	5	71	16	5	76	65	1087	22	0	2429	201
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	24	2	7	7	0	5	2
Cap, veh/h	166	10	140	98	31	92	65	4632	94	0	2335	1075
Arrive On Green	0.09	0.09	0.09	0.07	0.07	0.07	0.04	0.75	0.75	0.00	0.68	0.68
Sat Flow, veh/h	1774	105	1494	1388	434	1302	1774	6212	126	0	3529	1583
Grp Volume(v), veh/h	141	0	76	21	0	76	65	802	307	0	2429	201
Grp Sat Flow(s),veh/h/ln	1774	0	1599	1822	0	1302	1774	1528	1754	0	1719	1583
Q Serve(g_s), s	11.7	0.0	6.8	1.6	0.0	8.6	5.5	8.1	8.1	0.0	101.9	7.0
Cycle Q Clear(g_c), s	11.7	0.0	6.8	1.6	0.0	8.6	5.5	8.1	8.1	0.0	101.9	7.0
Prop In Lane	1.00		0.93	0.76		1.00	1.00		0.07	0.00		1.00
Lane Grp Cap(c), veh/h	166	0	150	129	0	92	65	3418	1308	0	2335	1075
V/C Ratio(X)	0.85	0.00	0.51	0.16	0.00	0.83	1.00	0.23	0.24	0.00	1.04	0.19
Avail Cap(c_a), veh/h	213	0	192	219	0	156	65	3418	1308	0	2335	1075
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.88	0.88	0.88	0.00	0.16	0.16
Uniform Delay (d), s/veh	66.9	0.0	64.7	65.5	0.0	68.8	72.2	5.9	5.9	0.0	24.1	8.8
Incr Delay (d2), s/veh	21.8	0.0	2.6	0.6	0.0	16.6	104.5	0.1	0.4	0.0	20.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	3.1	0.8	0.0	3.5	4.6	3.5	4.1	0.0	54.8	3.1
LnGrp Delay(d),s/veh	88.7	0.0	67.3	66.1	0.0	85.4	176.7	6.0	6.2	0.0	45.0	8.9
LnGrp LOS	F		E	E		F	F	A	A		F	A
Approach Vol, veh/h		217			97			1174			2630	
Approach Delay, s/veh		81.2			81.2			15.5			42.3	
Approach LOS		F			F			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		116.4		18.5	10.0	106.4		15.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		100.5		18.0	5.5	90.5		18.0
Max Q Clear Time (g_c+I1), s		10.1		13.7	7.5	103.9		10.6
Green Ext Time (p_c), s		80.8		0.3	0.0	0.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	35	240	105	120	10	290	945	75	60	2030	225
Future Volume (veh/h)	125	35	240	105	120	10	290	945	75	60	2030	225
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1267	1900	1900	1597	1900	1520	1900	1792	1743	1387	1827	1429
Adj Flow Rate, veh/h	136	38	261	114	130	11	315	1027	82	65	2207	245
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	50	0	0	19	0	25	0	6	9	37	4	33
Cap, veh/h	102	352	299	156	292	198	233	2729	826	77	1692	591
Arrive On Green	0.08	0.19	0.19	0.05	0.15	0.15	0.13	0.56	0.56	0.06	0.49	0.49
Sat Flow, veh/h	1206	1900	1615	2950	1900	1292	1810	4893	1480	1321	3471	1213
Grp Volume(v), veh/h	136	38	261	114	130	11	315	1027	82	65	2207	245
Grp Sat Flow(s),veh/h/ln	1206	1900	1615	1475	1900	1292	1810	1631	1480	1321	1736	1213
Q Serve(g_s), s	11.5	2.3	21.3	5.2	8.4	1.0	17.5	16.0	3.5	6.6	66.2	17.6
Cycle Q Clear(g_c), s	11.5	2.3	21.3	5.2	8.4	1.0	17.5	16.0	3.5	6.6	66.2	17.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	352	299	156	292	198	233	2729	826	77	1692	591
V/C Ratio(X)	1.33	0.11	0.87	0.73	0.45	0.06	1.35	0.38	0.10	0.84	1.30	0.41
Avail Cap(c_a), veh/h	102	495	421	241	490	333	233	2729	826	155	1692	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.2	46.0	53.8	63.4	52.3	49.1	59.2	16.8	14.1	63.3	34.8	22.4
Incr Delay (d2), s/veh	201.7	0.2	14.4	6.5	1.3	0.1	183.7	0.1	0.1	20.8	141.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	1.2	10.7	2.2	4.5	0.4	20.6	7.2	1.5	2.9	64.7	6.0
LnGrp Delay(d),s/veh	263.8	46.2	68.2	69.8	53.5	49.2	242.8	16.9	14.1	84.1	176.4	22.9
LnGrp LOS	F	D	E	E	D	D	F	B	B	F	F	C
Approach Vol, veh/h		435			255			1424			2517	
Approach Delay, s/veh		127.4			60.6			66.7			159.1	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	81.6	11.7	30.2	22.0	72.0	16.0	25.8
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	15.9	67.8	11.1	35.4	17.5	66.2	11.5	35.0
Max Q Clear Time (g_c+I1), s	8.6	18.0	7.2	23.3	19.5	68.2	13.5	10.4
Green Ext Time (p_c), s	0.1	47.2	0.1	1.8	0.0	0.0	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	122.3
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	15	175	1210	1755	785
Future Volume (veh/h)	40	15	175	1210	1755	785
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1900	1900	1810	1837	1900
Adj Flow Rate, veh/h	53	20	230	1592	2309	1033
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	5	0	0	5	5	5
Cap, veh/h	116	56	254	3058	2538	992
Arrive On Green	0.03	0.03	0.14	0.89	0.72	0.72
Sat Flow, veh/h	3343	1615	1810	3529	3712	1387
Grp Volume(v), veh/h	53	20	230	1592	2157	1185
Grp Sat Flow(s),veh/h/ln	1672	1615	1810	1719	1671	1591
Q Serve(g_s), s	2.1	1.6	16.8	12.8	69.6	96.3
Cycle Q Clear(g_c), s	2.1	1.6	16.8	12.8	69.6	96.3
Prop In Lane	1.00	1.00	1.00			0.87
Lane Grp Cap(c), veh/h	116	56	254	3058	2392	1138
V/C Ratio(X)	0.46	0.36	0.91	0.52	0.90	1.04
Avail Cap(c_a), veh/h	484	234	262	3074	2392	1138
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.7	63.5	57.0	1.5	15.3	19.1
Incr Delay (d2), s/veh	2.8	3.8	31.5	0.2	5.3	38.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.8	10.7	5.8	33.5	53.7
LnGrp Delay(d),s/veh	66.5	67.3	88.5	1.7	20.6	57.1
LnGrp LOS	E	E	F	A	C	F
Approach Vol, veh/h	73			1822	3342	
Approach Delay, s/veh	66.7			12.7	33.5	
Approach LOS	E			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.2	23.4	102.0				125.4
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		19.5	19.5	96.3				120.3
Max Q Clear Time (g_c+I1), s		4.1	18.8	98.3				14.8
Green Ext Time (p_c), s		0.1	0.0	0.0				104.7

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	580	225	185	387	290	487	990	110	150	1165	305
Future Volume (veh/h)	105	580	225	185	387	290	487	990	110	150	1165	305
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1863	1845	1900	1863	1900	1881	1779	1900	1696	1827	1827
Adj Flow Rate, veh/h	114	630	245	201	421	315	529	1076	120	163	1266	332
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	2	3	0	2	2	1	7	7	12	4	4
Cap, veh/h	140	1000	438	158	552	409	438	1070	119	157	1596	487
Arrive On Green	0.08	0.28	0.28	0.09	0.29	0.29	0.13	0.35	0.35	0.10	0.32	0.32
Sat Flow, veh/h	1707	3539	1551	1810	1919	1423	3476	3064	341	1616	4988	1520
Grp Volume(v), veh/h	114	630	245	201	388	348	529	593	603	163	1266	332
Grp Sat Flow(s),veh/h/ln	1707	1770	1551	1810	1770	1572	1738	1690	1716	1616	1663	1520
Q Serve(g_s), s	6.8	16.0	13.9	9.0	20.6	20.9	13.0	36.0	36.0	10.0	23.9	19.6
Cycle Q Clear(g_c), s	6.8	16.0	13.9	9.0	20.6	20.9	13.0	36.0	36.0	10.0	23.9	19.6
Prop In Lane	1.00		1.00	1.00		0.91	1.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	140	1000	438	158	509	452	438	590	599	157	1596	487
V/C Ratio(X)	0.81	0.63	0.56	1.27	0.76	0.77	1.21	1.01	1.01	1.04	0.79	0.68
Avail Cap(c_a), veh/h	166	1064	466	158	515	457	438	590	599	157	1596	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	32.3	31.5	47.1	33.5	33.6	45.1	33.6	33.6	46.6	32.0	30.5
Incr Delay (d2), s/veh	22.6	2.5	4.1	162.8	7.0	8.2	113.0	38.3	38.5	83.0	3.0	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	8.1	6.4	11.6	11.0	10.1	13.1	23.0	23.4	8.1	11.3	8.8
LnGrp Delay(d),s/veh	69.1	34.8	35.6	209.9	40.5	41.8	158.1	71.9	72.1	129.8	34.9	34.8
LnGrp LOS	E	C	D	F	D	D	F	F	F	F	C	C
Approach Vol, veh/h		989			937			1725			1761	
Approach Delay, s/veh		39.0			77.4			98.4			43.7	
Approach LOS		D			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	41.0	13.0	35.1	17.0	38.0	12.5	35.7
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	36.0	9.0	31.0	13.0	33.0	10.0	30.0
Max Q Clear Time (g_c+I1), s	12.0	38.0	11.0	18.0	15.0	25.9	8.8	22.9
Green Ext Time (p_c), s	0.0	0.0	0.0	10.8	0.0	7.0	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	66.1
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	40	125	90	310	60	270	285	165	60	640	90
Future Volume (veh/h)	20	40	125	90	310	60	270	285	165	60	640	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1477	1484	1900	1722	1792	1712	1694	1900	1387	1776	1727
Adj Flow Rate, veh/h	22	44	137	99	341	66	297	313	181	66	703	99
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	33	33	28	9	9	6	11	7	7	37	7	10
Cap, veh/h	44	54	351	40	37	424	299	539	312	78	729	589
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.18	0.53	0.53	0.06	0.41	0.41
Sat Flow, veh/h	0	193	1259	0	133	1522	1630	1008	583	1321	1776	1436
Grp Volume(v), veh/h	66	0	137	440	0	66	297	0	494	66	703	99
Grp Sat Flow(s),veh/h/ln	193	0	1259	133	0	1522	1630	0	1591	1321	1776	1436
Q Serve(g_s), s	0.0	0.0	9.6	0.0	0.0	3.6	19.9	0.0	23.0	5.4	42.3	4.8
Cycle Q Clear(g_c), s	30.5	0.0	9.6	30.5	0.0	3.6	19.9	0.0	23.0	5.4	42.3	4.8
Prop In Lane	0.33		1.00	0.22		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	98	0	351	77	0	424	299	0	851	78	729	589
V/C Ratio(X)	0.68	0.00	0.39	5.69	0.00	0.16	0.99	0.00	0.58	0.85	0.96	0.17
Avail Cap(c_a), veh/h	98	0	351	77	0	424	299	0	851	152	736	595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	32.0	40.7	0.0	29.8	44.7	0.0	17.2	51.0	31.5	20.5
Incr Delay (d2), s/veh	17.7	0.0	0.8	2136.4	0.0	0.2	50.0	0.0	1.9	23.7	25.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.4	48.2	0.0	1.5	13.1	0.0	10.5	2.5	25.8	2.0
LnGrp Delay(d),s/veh	50.7	0.0	32.8	2177.1	0.0	30.0	94.7	0.0	19.1	74.7	56.8	20.8
LnGrp LOS	D		C	F		C	F		B	E	E	C
Approach Vol, veh/h		203			506			791			868	
Approach Delay, s/veh		38.7			1897.0			47.5			54.0	
Approach LOS		D			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.6	64.0		35.0	24.2	50.3		35.0
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	12.6	52.9		30.5	20.1	45.4		30.5
Max Q Clear Time (g_c+I1), s	7.4	25.0		32.5	21.9	44.3		32.5
Green Ext Time (p_c), s	0.1	19.5		0.0	0.0	0.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	444.3
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	90	60	730	205	195	55	695	810	250	645	20
Future Volume (veh/h)	25	90	60	730	205	195	55	695	810	250	645	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1881	1900	1845	1837	1863	1863	1792	1863	1827	1779	1900
Adj Flow Rate, veh/h	28	100	67	520	636	217	61	772	900	278	717	22
Adj No. of Lanes	1	2	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	1	3	4	2	2	6	2	4	7	7
Cap, veh/h	130	177	109	521	545	467	78	1202	558	222	1460	45
Arrive On Green	0.08	0.08	0.08	0.30	0.30	0.30	0.04	0.35	0.35	0.13	0.44	0.44
Sat Flow, veh/h	1547	2110	1301	1757	1837	1575	1774	3406	1581	1740	3346	103
Grp Volume(v), veh/h	28	83	84	520	636	217	61	772	900	278	362	377
Grp Sat Flow(s),veh/h/ln	1547	1787	1624	1757	1837	1575	1774	1703	1581	1740	1690	1758
Q Serve(g_s), s	2.2	6.0	6.6	39.4	39.5	15.0	4.5	25.3	47.0	17.0	20.5	20.5
Cycle Q Clear(g_c), s	2.2	6.0	6.6	39.4	39.5	15.0	4.5	25.3	47.0	17.0	20.5	20.5
Prop In Lane	1.00		0.80	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	130	150	137	521	545	467	78	1202	558	222	737	767
V/C Ratio(X)	0.22	0.55	0.61	1.00	1.17	0.46	0.78	0.64	1.61	1.25	0.49	0.49
Avail Cap(c_a), veh/h	325	376	341	521	545	467	147	1202	558	222	737	767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	58.6	58.9	46.8	46.9	38.2	63.0	36.1	43.1	58.1	26.9	26.9
Incr Delay (d2), s/veh	0.8	3.2	4.4	38.9	93.9	0.7	15.2	1.3	284.4	144.9	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.1	3.1	24.7	34.2	6.6	2.5	12.1	64.5	17.1	9.7	10.1
LnGrp Delay(d),s/veh	57.7	61.8	63.3	85.7	140.7	38.9	78.2	37.4	327.5	203.0	27.7	27.6
LnGrp LOS	E	E	E	F	F	D	E	D	F	F	C	C
Approach Vol, veh/h		195			1373			1733			1017	
Approach Delay, s/veh		61.8			103.8			189.5			75.6	
Approach LOS		E			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	52.0		16.2	9.9	63.1		44.0
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	17.0	47.0		28.0	11.0	53.0		39.5
Max Q Clear Time (g_c+I1), s	19.0	49.0		8.6	6.5	22.5		41.5
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	24.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	129.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	1045	15	15	1105	460	20	10	10	370	15	190
Future Volume (veh/h)	135	1045	15	15	1105	460	20	10	10	370	15	190
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1792	1863	1827	1900	1659	1900	1759	1769	1776
Adj Flow Rate, veh/h	155	1201	17	17	1270	0	23	11	11	437	0	218
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	1	1	6	2	4	0	12	12	8	0	7
Cap, veh/h	202	1662	24	27	1282	563	159	66	66	698	0	312
Arrive On Green	0.11	0.46	0.46	0.02	0.36	0.00	0.09	0.09	0.09	0.21	0.00	0.21
Sat Flow, veh/h	1774	3609	51	1707	3539	1553	1810	757	757	3351	0	1501
Grp Volume(v), veh/h	155	595	623	17	1270	0	23	0	22	437	0	218
Grp Sat Flow(s),veh/h/ln	1774	1787	1872	1707	1770	1553	1810	0	1513	1675	0	1501
Q Serve(g_s), s	7.3	23.0	23.0	0.8	30.5	0.0	1.0	0.0	1.2	10.2	0.0	11.5
Cycle Q Clear(g_c), s	7.3	23.0	23.0	0.8	30.5	0.0	1.0	0.0	1.2	10.2	0.0	11.5
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	202	823	863	27	1282	563	159	0	133	698	0	312
V/C Ratio(X)	0.77	0.72	0.72	0.64	0.99	0.00	0.15	0.00	0.17	0.63	0.00	0.70
Avail Cap(c_a), veh/h	207	823	863	100	1282	563	159	0	133	1253	0	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.8	18.6	18.7	41.9	27.1	0.0	36.1	0.0	36.1	30.8	0.0	31.4
Incr Delay (d2), s/veh	15.4	4.8	4.6	22.9	22.9	0.0	1.9	0.0	2.7	1.3	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	12.3	12.9	0.6	18.9	0.0	0.6	0.0	0.6	4.8	0.0	5.1
LnGrp Delay(d),s/veh	52.2	23.5	23.3	64.8	50.0	0.0	38.0	0.0	38.8	32.2	0.0	35.4
LnGrp LOS	D	C	C	E	D		D		D	C		D
Approach Vol, veh/h		1373			1287			45			655	
Approach Delay, s/veh		26.6			50.2			38.4			33.2	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.5	5.8	44.4		22.8	14.2	36.0
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.5	5.0	36.0		32.0	10.0	31.0
Max Q Clear Time (g_c+I1), s		3.2	2.8	25.0		13.5	9.3	32.5
Green Ext Time (p_c), s		0.0	0.0	10.8		3.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	930	465	330	1215	0	0	0	0	95	0	390
Future Volume (veh/h)	0	930	465	330	1215	0	0	0	0	95	0	390
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1810	1881	1845	0				1827	1827	1900
Adj Flow Rate, veh/h	0	1045	522	371	1365	0				107	0	438
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	5	1	3	0				4	0	4
Cap, veh/h	0	1255	544	404	2251	0				445	0	397
Arrive On Green	0.00	0.35	0.35	0.23	0.64	0.00				0.26	0.00	0.26
Sat Flow, veh/h	0	3632	1534	1792	3597	0				1740	0	1553
Grp Volume(v), veh/h	0	1045	522	371	1365	0				107	0	438
Grp Sat Flow(s),veh/h/ln	0	1770	1534	1792	1752	0				1740	0	1553
Q Serve(g_s), s	0.0	24.3	30.0	18.2	20.5	0.0				4.4	0.0	23.0
Cycle Q Clear(g_c), s	0.0	24.3	30.0	18.2	20.5	0.0				4.4	0.0	23.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1255	544	404	2251	0				445	0	397
V/C Ratio(X)	0.00	0.83	0.96	0.92	0.61	0.00				0.24	0.00	1.10
Avail Cap(c_a), veh/h	0	1255	544	426	2251	0				445	0	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.65	0.65	0.30	0.30	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.6	28.4	34.0	9.4	0.0				26.6	0.0	33.5
Incr Delay (d2), s/veh	0.0	4.4	22.9	9.1	0.4	0.0				0.1	0.0	76.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.7	16.1	10.0	10.0	0.0				2.1	0.0	18.2
LnGrp Delay(d),s/veh	0.0	31.0	51.3	43.2	9.8	0.0				26.7	0.0	109.7
LnGrp LOS		C	D	D	A					C		F
Approach Vol, veh/h		1567			1736						545	
Approach Delay, s/veh		37.8			16.9						93.4	
Approach LOS		D			B						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.9	37.0		27.1		62.9		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	21.4	30.8		23.0		57.8		
Max Q Clear Time (g_c+I1), s	20.2	32.0		25.0		22.5		
Green Ext Time (p_c), s	0.1	0.0		0.0		20.7		

Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
19: I-80 EB Ramps & Rocklin Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	835	0	0	990	65	555	5	1295	0	0	0
Future Volume (veh/h)	190	835	0	0	990	65	555	5	1295	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1863	0	0	1863	1863	1845	1878	1881			
Adj Flow Rate, veh/h	211	928	0	0	1100	72	413	0	1661			
Adj No. of Lanes	1	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	2	0	0	2	2	3	0	1			
Cap, veh/h	216	1654	0	0	1107	495	797	0	1451			
Arrive On Green	0.12	0.47	0.00	0.00	0.31	0.31	0.45	0.00	0.45			
Sat Flow, veh/h	1757	3632	0	0	3632	1583	1757	0	3198			
Grp Volume(v), veh/h	211	928	0	0	1100	72	413	0	1661			
Grp Sat Flow(s),veh/h/ln	1757	1770	0	0	1770	1583	1757	0	1599			
Q Serve(g_s), s	13.2	20.8	0.0	0.0	34.1	3.6	18.5	0.0	49.9			
Cycle Q Clear(g_c), s	13.2	20.8	0.0	0.0	34.1	3.6	18.5	0.0	49.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	216	1654	0	0	1107	495	797	0	1451			
V/C Ratio(X)	0.98	0.56	0.00	0.00	0.99	0.15	0.52	0.00	1.14			
Avail Cap(c_a), veh/h	216	1654	0	0	1107	495	797	0	1451			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.55	0.55	0.00	0.00	0.89	0.89	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.1	21.2	0.0	0.0	37.7	27.2	21.5	0.0	30.0			
Incr Delay (d2), s/veh	39.5	0.8	0.0	0.0	24.1	0.5	0.8	0.0	73.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.8	10.4	0.0	0.0	20.4	1.7	9.1	0.0	36.8			
LnGrp Delay(d),s/veh	87.6	21.9	0.0	0.0	61.8	27.8	22.3	0.0	103.9			
LnGrp LOS	F	C			E	C	C		F			
Approach Vol, veh/h		1139			1172			2074				
Approach Delay, s/veh		34.1			59.7			87.7				
Approach LOS		C			E			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		56.0			17.0	39.0		54.0
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		51.4			13.5	34.4		49.9
Max Q Clear Time (g_c+I1), s		22.8			15.2	36.1		51.9
Green Ext Time (p_c), s		13.2			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	66.3
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1895	185	30	745	0	310	0	70	0	0	0
Future Volume (veh/h)	50	1895	185	30	745	0	310	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1866	1900	1583	1863	0	1845	0	1638			
Adj Flow Rate, veh/h	57	2178	213	34	856	0	356	0	80			
Adj No. of Lanes	1	3	0	1	3	0	1	0	1			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Percent Heavy Veh, %	0	1	1	20	2	0	3	0	16			
Cap, veh/h	103	2604	251	41	2659	0	409	0	324			
Arrive On Green	0.06	0.55	0.55	0.03	0.52	0.00	0.23	0.00	0.23			
Sat Flow, veh/h	1810	4715	454	1508	5253	0	1757	0	1392			
Grp Volume(v), veh/h	57	1560	831	34	856	0	356	0	80			
Grp Sat Flow(s),veh/h/ln	1810	1698	1773	1508	1695	0	1757	0	1392			
Q Serve(g_s), s	2.2	27.4	28.4	1.6	7.0	0.0	14.0	0.0	3.4			
Cycle Q Clear(g_c), s	2.2	27.4	28.4	1.6	7.0	0.0	14.0	0.0	3.4			
Prop In Lane	1.00		0.26	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	103	1876	979	41	2659	0	409	0	324			
V/C Ratio(X)	0.56	0.83	0.85	0.82	0.32	0.00	0.87	0.00	0.25			
Avail Cap(c_a), veh/h	151	1876	979	117	2755	0	525	0	416			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.1	13.3	13.6	34.8	9.9	0.0	26.6	0.0	22.5			
Incr Delay (d2), s/veh	4.6	3.9	8.1	31.3	0.2	0.0	12.1	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	13.6	15.8	1.0	3.3	0.0	8.2	0.0	1.3			
LnGrp Delay(d),s/veh	37.7	17.2	21.7	66.2	10.0	0.0	38.7	0.0	22.9			
LnGrp LOS	D	B	C	E	B		D		C			
Approach Vol, veh/h		2448			890			436				
Approach Delay, s/veh		19.2			12.2			35.8				
Approach LOS		B			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	6.0	44.8			8.1	42.6		21.3
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	39.4			6.0	39.0		21.5
Max Q Clear Time (g_c+I1), s	3.6	30.4			4.2	9.0		16.0
Green Ext Time (p_c), s	0.0	8.9			0.0	28.7		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	19.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	20	865	2140	5
Future Vol, veh/h	0	0	20	865	2140	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	21	911	2253	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1129	2258	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	173	95	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	173	95	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	95	-	-	-	-
HCM Lane V/C Ratio	0.222	-	-	-	-
HCM Control Delay (s)	53.4	-	0	-	-
HCM Lane LOS	F	-	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	215	35	205	355	160	70	90	40	105	390	90
Future Volume (veh/h)	120	215	35	205	355	160	70	90	40	105	390	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	234	38	223	386	174	76	98	43	114	424	98
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	430	70	263	403	182	98	661	275	144	851	195
Arrive On Green	0.09	0.27	0.27	0.15	0.33	0.33	0.05	0.27	0.27	0.08	0.30	0.30
Sat Flow, veh/h	1774	1564	254	1774	1217	549	1774	2438	1015	1774	2861	656
Grp Volume(v), veh/h	130	0	272	223	0	560	76	70	71	114	261	261
Grp Sat Flow(s),veh/h/ln	1774	0	1818	1774	0	1766	1774	1770	1684	1774	1770	1747
Q Serve(g_s), s	5.7	0.0	10.2	9.8	0.0	24.8	3.4	2.4	2.6	5.0	9.7	9.9
Cycle Q Clear(g_c), s	5.7	0.0	10.2	9.8	0.0	24.8	3.4	2.4	2.6	5.0	9.7	9.9
Prop In Lane	1.00		0.14	1.00		0.31	1.00		0.60	1.00		0.38
Lane Grp Cap(c), veh/h	162	0	499	263	0	585	98	480	456	144	526	519
V/C Ratio(X)	0.80	0.00	0.54	0.85	0.00	0.96	0.78	0.15	0.16	0.79	0.50	0.50
Avail Cap(c_a), veh/h	166	0	499	306	0	585	140	480	456	166	526	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.43	0.00	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	24.7	33.2	0.0	26.2	37.3	22.1	22.2	36.1	23.2	23.2
Incr Delay (d2), s/veh	23.3	0.0	1.2	8.4	0.0	15.3	16.0	0.6	0.7	19.8	3.3	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	5.3	5.4	0.0	14.5	2.1	1.2	1.3	3.3	5.2	5.3
LnGrp Delay(d),s/veh	59.0	0.0	26.0	41.7	0.0	41.5	53.3	22.8	22.9	55.9	26.5	26.7
LnGrp LOS	E		C	D		D	D	C	C	E	C	C
Approach Vol, veh/h		402			783			217			636	
Approach Delay, s/veh		36.6			41.6			33.5			31.8	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	26.2	16.3	26.5	8.9	28.3	11.8	31.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	20.5	13.8	20.2	6.3	21.7	7.5	26.5
Max Q Clear Time (g_c+I1), s	7.0	4.6	11.8	12.2	5.4	11.9	7.7	26.8
Green Ext Time (p_c), s	0.0	3.7	0.1	3.4	0.0	2.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	715	1180	50	10	515	115	160	10	20	15	5	65
Future Volume (veh/h)	715	1180	50	10	515	115	160	10	20	15	5	65
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	777	1283	54	11	560	125	174	11	22	16	42	46
Adj No. of Lanes	1	3	0	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	812	2551	107	246	839	183	215	67	135	24	64	76
Arrive On Green	0.46	0.51	0.51	0.14	0.20	0.20	0.12	0.12	0.12	0.05	0.05	0.05
Sat Flow, veh/h	1774	5005	211	1774	4178	914	1774	556	1111	507	1331	1583
Grp Volume(v), veh/h	777	869	468	11	452	233	174	0	33	58	0	46
Grp Sat Flow(s),veh/h/ln	1774	1695	1826	1774	1695	1701	1774	0	1667	1837	0	1583
Q Serve(g_s), s	41.8	16.7	16.7	0.5	12.2	12.5	9.5	0.0	1.8	3.1	0.0	2.8
Cycle Q Clear(g_c), s	41.8	16.7	16.7	0.5	12.2	12.5	9.5	0.0	1.8	3.1	0.0	2.8
Prop In Lane	1.00		0.12	1.00		0.54	1.00		0.67	0.28		1.00
Lane Grp Cap(c), veh/h	812	1728	931	246	680	342	215	0	202	89	0	76
V/C Ratio(X)	0.96	0.50	0.50	0.04	0.66	0.68	0.81	0.00	0.16	0.65	0.00	0.60
Avail Cap(c_a), veh/h	878	2327	1253	246	821	412	537	0	505	93	0	80
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.9	16.0	16.0	37.0	36.5	36.7	42.4	0.0	39.0	46.3	0.0	46.2
Incr Delay (d2), s/veh	19.8	0.8	1.5	0.1	4.1	8.7	7.0	0.0	0.4	14.5	0.0	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.8	8.0	8.8	0.3	6.1	6.7	5.1	0.0	0.8	1.9	0.0	1.5
LnGrp Delay(d),s/veh	45.7	16.8	17.5	37.0	40.6	45.3	49.4	0.0	39.4	60.8	0.0	57.4
LnGrp LOS	D	B	B	D	D	D	D		D	E		E
Approach Vol, veh/h		2114			696			207			104	
Approach Delay, s/veh		27.6			42.1			47.8			59.3	
Approach LOS		C			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.7	55.5		16.0	49.4	24.9		8.8
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 68		30.0	49.0	24.0		5.0
Max Q Clear Time (g_c+I1), s	2.5	18.7		11.5	43.8	14.5		5.1
Green Ext Time (p_c), s	1.6	31.8		0.6	1.5	5.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	33	93	860	2103	37
Future Vol, veh/h	13	33	93	860	2103	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	160	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	36	101	935	2286	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2976	1163	2326	0	-	0
Stage 1	2306	-	-	-	-	-
Stage 2	670	-	-	-	-	-
Critical Hdwy	6.29	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	17	161	~ 85	-	-	-
Stage 1	36	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	0	161	~ 85	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	36	-	-	-	-	-
Stage 2	0	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s		24	0
HCM LOS	-		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	~ 85	-	-	161	-	-
HCM Lane V/C Ratio	1.189	-	-	0.223	-	-
HCM Control Delay (s)	246.4	-	-	33.7	-	-
HCM Lane LOS	F	-	-	D	-	-
HCM 95th %tile Q(veh)	7.2	-	-	0.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	210	965	430	400	0	475	0	85	5	0	5
Future Volume (veh/h)	0	210	965	430	400	0	475	0	85	5	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1681	1810	1776	1681	1900	1743	1827	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	233	0	478	444	0	528	0	94	6	0	6
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	13	5	7	13	13	9	0	0	0	0	0
Cap, veh/h	2	318	291	501	885	0	562	0	525	25	0	22
Arrive On Green	0.00	0.19	0.00	0.30	0.53	0.00	0.34	0.00	0.34	0.01	0.00	0.01
Sat Flow, veh/h	1810	1681	1538	1691	1681	0	1660	0	1553	1810	0	1615
Grp Volume(v), veh/h	0	233	0	478	444	0	528	0	94	6	0	6
Grp Sat Flow(s),veh/h/ln	1810	1681	1538	1691	1681	0	1660	0	1553	1810	0	1615
Q Serve(g_s), s	0.0	14.5	0.0	30.8	18.9	0.0	34.3	0.0	4.7	0.4	0.0	0.4
Cycle Q Clear(g_c), s	0.0	14.5	0.0	30.8	18.9	0.0	34.3	0.0	4.7	0.4	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	318	291	501	885	0	562	0	525	25	0	22
V/C Ratio(X)	0.00	0.73	0.00	0.95	0.50	0.00	0.94	0.00	0.18	0.24	0.00	0.27
Avail Cap(c_a), veh/h	81	628	574	510	1059	0	627	0	587	81	0	73
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.4	0.0	38.3	16.9	0.0	35.7	0.0	25.9	54.2	0.0	54.2
Incr Delay (d2), s/veh	0.0	3.3	0.0	28.2	0.4	0.0	21.2	0.0	0.2	4.8	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	0.0	18.3	8.9	0.0	19.0	0.0	2.1	0.2	0.0	0.2
LnGrp Delay(d),s/veh	0.0	45.6	0.0	66.6	17.4	0.0	56.8	0.0	26.1	59.0	0.0	60.4
LnGrp LOS		D		E	B		E		C	E		E
Approach Vol, veh/h		233			922			622			12	
Approach Delay, s/veh		45.6			42.9			52.2			59.7	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		42.1	37.4	25.5		6.0	0.0	63.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.0	33.5	41.5		5.0	5.0	70.0
Max Q Clear Time (g_c+I1), s		36.3	32.8	16.5		2.4	0.0	20.9
Green Ext Time (p_c), s		1.3	0.1	4.5		0.0	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.6
HCM 2010 LOS	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	195	580	10	275	1865
Future Volume (veh/h)	5	195	580	10	275	1865
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1746	1900	1881	1845
Adj Flow Rate, veh/h	5	214	637	11	302	2049
Adj No. of Lanes	0	0	2	0	1	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	9	9	1	3
Cap, veh/h	6	258	1473	25	352	2468
Arrive On Green	0.16	0.16	0.44	0.44	0.20	0.70
Sat Flow, veh/h	37	1576	3423	58	1792	3597
Grp Volume(v), veh/h	220	0	317	331	302	2049
Grp Sat Flow(s),veh/h/ln	1620	0	1658	1735	1792	1752
Q Serve(g_s), s	9.0	0.0	9.0	9.0	11.1	28.4
Cycle Q Clear(g_c), s	9.0	0.0	9.0	9.0	11.1	28.4
Prop In Lane	0.02	0.97		0.03	1.00	
Lane Grp Cap(c), veh/h	265	0	732	766	352	2468
V/C Ratio(X)	0.83	0.00	0.43	0.43	0.86	0.83
Avail Cap(c_a), veh/h	428	0	732	766	444	2468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	13.1	13.1	26.5	7.2
Incr Delay (d2), s/veh	7.2	0.0	1.9	1.8	12.8	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	4.4	4.6	6.7	14.5
LnGrp Delay(d),s/veh	34.7	0.0	15.0	14.9	39.2	10.6
LnGrp LOS	C		B	B	D	B
Approach Vol, veh/h	220		648			2351
Approach Delay, s/veh	34.7		15.0			14.3
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.9	34.6				52.5		15.7
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	16.9	26.6				48.0		18.0
Max Q Clear Time (g_c+I1), s	13.1	11.0				30.4		11.0
Green Ext Time (p_c), s	0.3	14.1				15.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	81.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	135	5	225	0	645	10	30	1760	5
Future Vol, veh/h	5	0	0	135	5	225	0	645	10	30	1760	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	6	0	0	159	6	265	0	759	12	35	2071	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2526	2915	1038	1871	2912	385	2076	0	0	771	0	0
Stage 1	2144	2144	-	765	765	-	-	-	-	-	-	-
Stage 2	382	771	-	1106	2147	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	14	16	231	~ 45	16	619	272	-	-	853	-	-
Stage 1	51	89	-	366	415	-	-	-	-	-	-	-
Stage 2	618	413	-	228	89	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 5	15	231	~ 44	15	619	272	-	-	853	-	-
Mov Cap-2 Maneuver	~ 5	15	-	~ 44	15	-	-	-	-	-	-	-
Stage 1	51	85	-	366	415	-	-	-	-	-	-	-
Stage 2	349	413	-	219	85	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1383.4	$ 607.2	0	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	272	-	-	5	-	41	619	853	-	-
HCM Lane V/C Ratio	-	-	-	1.176	-	4.017	0.428	0.041	-	-
HCM Control Delay (s)	0	-	$	1383.4	$	1558.8	15.1	9.4	-	-
HCM Lane LOS	A	-	-	F	A	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	-	18.8	2.1	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	15	115	105	40	15	125	205	30	10	625	270
Future Volume (veh/h)	80	15	115	105	40	15	125	205	30	10	625	270
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1813	1792	1900	1900	1900	1810	1768	1900	1900	1845	1759
Adj Flow Rate, veh/h	99	19	142	130	49	19	154	253	37	12	772	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	9	9	6	0	0	0	5	8	8	0	3	8
Cap, veh/h	171	33	179	156	59	23	183	836	122	26	853	691
Arrive On Green	0.12	0.12	0.12	0.13	0.13	0.13	0.11	0.55	0.55	0.01	0.46	0.00
Sat Flow, veh/h	1460	280	1524	1188	448	174	1723	1508	221	1810	1845	1495
Grp Volume(v), veh/h	118	0	142	198	0	0	154	0	290	12	772	0
Grp Sat Flow(s),veh/h/ln	1740	0	1524	1810	0	0	1723	0	1729	1810	1845	1495
Q Serve(g_s), s	6.3	0.0	8.9	10.5	0.0	0.0	8.6	0.0	8.8	0.6	38.1	0.0
Cycle Q Clear(g_c), s	6.3	0.0	8.9	10.5	0.0	0.0	8.6	0.0	8.8	0.6	38.1	0.0
Prop In Lane	0.84		1.00	0.66		0.10	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	204	0	179	237	0	0	183	0	959	26	853	691
V/C Ratio(X)	0.58	0.00	0.80	0.83	0.00	0.00	0.84	0.00	0.30	0.47	0.91	0.00
Avail Cap(c_a), veh/h	318	0	279	331	0	0	184	0	959	92	853	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.1	0.0	42.3	41.7	0.0	0.0	43.2	0.0	11.7	48.1	24.5	0.0
Incr Delay (d2), s/veh	2.6	0.0	8.3	12.1	0.0	0.0	27.7	0.0	0.8	12.6	14.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	4.2	6.0	0.0	0.0	5.5	0.0	4.4	0.4	22.8	0.0
LnGrp Delay(d),s/veh	43.7	0.0	50.6	53.8	0.0	0.0	70.9	0.0	12.5	60.7	39.4	0.0
LnGrp LOS	D		D	D			E		B	E	D	
Approach Vol, veh/h		260			198			444			784	
Approach Delay, s/veh		47.5			53.8			32.8			39.7	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	59.1		16.0	15.0	50.0		17.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	51.0		18.0	10.5	45.5		18.0
Max Q Clear Time (g_c+I1), s	2.6	10.8		10.9	10.6	40.1		12.5
Green Ext Time (p_c), s	0.0	9.5		0.6	0.0	3.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	17	338	936	0
Future Vol, veh/h	0	9	17	338	936	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	6	5	0
Mvmt Flow	0	12	23	457	1265	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1768	1265	1265	0	-	0
Stage 1	1265	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	93	209	556	-	-	-
Stage 1	268	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	89	209	556	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	268	-	-	-	-	-
Stage 2	587	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.3	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	556	-	209	-	-
HCM Lane V/C Ratio	0.041	-	0.058	-	-
HCM Control Delay (s)	11.8	-	23.3	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	95	260	45	185	760
Future Volume (veh/h)	50	95	260	45	185	760
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1832	1900	1810	1827
Adj Flow Rate, veh/h	70	134	366	63	261	1070
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Percent Heavy Veh, %	0	0	4	4	5	4
Cap, veh/h	85	163	745	128	305	1330
Arrive On Green	0.15	0.15	0.49	0.49	0.18	0.73
Sat Flow, veh/h	573	1097	1524	262	1723	1827
Grp Volume(v), veh/h	205	0	0	429	261	1070
Grp Sat Flow(s),veh/h/ln	1678	0	0	1786	1723	1827
Q Serve(g_s), s	8.6	0.0	0.0	11.8	10.7	28.0
Cycle Q Clear(g_c), s	8.6	0.0	0.0	11.8	10.7	28.0
Prop In Lane	0.34	0.65		0.15	1.00	
Lane Grp Cap(c), veh/h	249	0	0	873	305	1330
V/C Ratio(X)	0.82	0.00	0.00	0.49	0.85	0.80
Avail Cap(c_a), veh/h	415	0	0	873	391	1330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	0.0	0.0	12.5	29.0	6.5
Incr Delay (d2), s/veh	6.7	0.0	0.0	2.0	13.7	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	6.2	6.2	15.6
LnGrp Delay(d),s/veh	36.8	0.0	0.0	14.5	42.8	11.8
LnGrp LOS	D			B	D	B
Approach Vol, veh/h	205		429			1331
Approach Delay, s/veh	36.8		14.5			17.8
Approach LOS	D		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.4	40.1				57.5		15.3
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	16.5	32.0				53.0		18.0
Max Q Clear Time (g_c+I1), s	12.7	13.8				30.0		10.6
Green Ext Time (p_c), s	0.3	11.3				13.1		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	55.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	45	275	160	170	715
Future Vol, veh/h	55	45	275	160	170	715
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	0	0	3	1	0	2
Mvmt Flow	92	75	458	267	283	1192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2350	592	0	0	725	0
Stage 1	592	-	-	-	-	-
Stage 2	1758	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 40	510	-	-	887	-
Stage 1	557	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 27	510	-	-	887	-
Mov Cap-2 Maneuver	~ 27	-	-	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	105	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 765	0	2.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	27	510	887	-
HCM Lane V/C Ratio	-	-	3.395	0.147	0.319	-
HCM Control Delay (s)	-	-	$ 1380.1	13.3	11	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	11.2	0.5	1.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	249.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	127	0	103	3	332	129	109	657	4
Future Vol, veh/h	0	0	3	127	0	103	3	332	129	109	657	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	2	0
Mvmt Flow	0	0	4	187	0	151	4	488	190	160	966	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1958	1977	969	1884	1885	583	972	0	0	678	0	0
Stage 1	1290	1290	-	592	592	-	-	-	-	-	-	-
Stage 2	668	687	-	1292	1293	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	48	63	310	~ 55	71	516	717	-	-	923	-	-
Stage 1	203	236	-	496	497	-	-	-	-	-	-	-
Stage 2	451	450	-	202	235	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	52	310	~ 47	58	516	717	-	-	923	-	-
Mov Cap-2 Maneuver	29	52	-	~ 47	58	-	-	-	-	-	-	-
Stage 1	202	195	-	493	494	-	-	-	-	-	-	-
Stage 2	317	447	-	~ 165	194	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	$ 1584.5	0.1	1.4
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	717	-	-	310	79	923	-	-
HCM Lane V/C Ratio	0.006	-	-	0.014	4.281	0.174	-	-
HCM Control Delay (s)	10.1	-	-	16.8	$ 1584.5	9.7	-	-
HCM Lane LOS	B	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	35.9	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	24.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	161	60	404	304	111	676
Future Vol, veh/h	161	60	404	304	111	676
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	3	1	1	2
Mvmt Flow	218	81	546	411	150	914

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1965	751	0	0	957	0
Stage 1	751	-	-	-	-	-
Stage 2	1214	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	~ 70	414	-	-	723	-
Stage 1	470	-	-	-	-	-
Stage 2	284	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 55	414	-	-	723	-
Mov Cap-2 Maneuver	~ 160	-	-	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	225	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	187.1	0	1.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	160	414	723	-
HCM Lane V/C Ratio	-	-	1.36	0.196	0.207	-
HCM Control Delay (s)	-	-	251	15.8	11.3	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	13.3	0.7	0.8	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	37	55	707	843	0
Future Vol, veh/h	1	37	55	707	843	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	19	9	3	3	0
Mvmt Flow	1	50	74	955	1139	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2243	1139	1139	0	-	0
Stage 1	1139	-	-	-	-	-
Stage 2	1104	-	-	-	-	-
Critical Hdwy	6.4	6.39	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.471	2.281	-	-	-
Pot Cap-1 Maneuver	47	226	589	-	-	-
Stage 1	308	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	41	226	589	-	-	-
Mov Cap-2 Maneuver	153	-	-	-	-	-
Stage 1	308	-	-	-	-	-
Stage 2	280	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.9	0.9	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	589	-	223	-	-
HCM Lane V/C Ratio	0.126	-	0.23	-	-
HCM Control Delay (s)	12	-	25.9	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.4	-	0.9	-	-

Intersection	
Int Delay, s/veh	35.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	220	5	0	10	85	870	5	25	1085	15
Future Vol, veh/h	0	0	220	5	0	10	85	870	5	25	1085	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	7	3	4	0	0	6	20
Mvmt Flow	0	0	232	5	0	11	89	916	5	26	1142	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1142	2292	2292	918	1142	0	0	921	0	0
Stage 1	-	-	-	1097	1097	-	-	-	-	-	-	-
Stage 2	-	-	-	1195	1195	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.1	6.5	6.27	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.5	4	3.363	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	244	28	40	322	608	-	-	750	-	-
Stage 1	0	0	-	261	291	-	-	-	-	-	-	-
Stage 2	0	0	-	230	262	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	244	~ 1	33	322	608	-	-	750	-	-
Mov Cap-2 Maneuver	-	-	-	~ 1	33	-	-	-	-	-	-	-
Stage 1	-	-	-	223	248	-	-	-	-	-	-	-
Stage 2	-	-	-	11	253	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	88.5	$ 4103.8	1.1	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	608	-	-	244	3	750	-	-
HCM Lane V/C Ratio	0.147	-	-	0.949	5.263	0.035	-	-
HCM Control Delay (s)	11.9	-	-	88.5	$ 4103.8	10	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	8.6	3.4	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	240	490	80	70	40	410	385	320	65	265	65
Future Volume (veh/h)	90	240	490	80	70	40	410	385	320	65	265	65
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1845	1827	1817	1900	1759	1845	1845	1863	1823	1900
Adj Flow Rate, veh/h	101	270	551	90	79	45	461	433	360	73	298	73
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	4	3	4	6	6	8	3	3	2	5	5
Cap, veh/h	458	486	408	197	122	70	493	742	622	94	427	102
Arrive On Green	0.27	0.27	0.27	0.11	0.11	0.11	0.29	0.40	0.40	0.05	0.16	0.16
Sat Flow, veh/h	1723	1827	1534	1740	1079	614	1675	1845	1547	1774	2737	656
Grp Volume(v), veh/h	101	270	551	90	0	124	461	433	360	73	186	185
Grp Sat Flow(s),veh/h/ln	1723	1827	1534	1740	0	1693	1675	1845	1547	1774	1732	1661
Q Serve(g_s), s	4.8	13.4	28.0	5.1	0.0	7.4	28.2	19.3	19.1	4.3	10.7	11.1
Cycle Q Clear(g_c), s	4.8	13.4	28.0	5.1	0.0	7.4	28.2	19.3	19.1	4.3	10.7	11.1
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	458	486	408	197	0	192	493	742	622	94	270	259
V/C Ratio(X)	0.22	0.56	1.35	0.46	0.00	0.65	0.93	0.58	0.58	0.78	0.69	0.71
Avail Cap(c_a), veh/h	458	486	408	463	0	450	565	797	668	185	337	323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	33.3	38.7	43.7	0.0	44.7	36.2	24.6	24.5	49.3	42.1	42.2
Incr Delay (d2), s/veh	0.1	0.8	173.5	0.6	0.0	1.4	21.5	0.5	0.6	5.2	2.6	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	6.9	31.5	2.5	0.0	3.5	16.0	10.0	8.2	2.2	5.3	5.4
LnGrp Delay(d),s/veh	30.2	34.2	212.2	44.3	0.0	46.1	57.7	25.1	25.1	54.5	44.6	45.8
LnGrp LOS	C	C	F	D		D	E	C	C	D	D	D
Approach Vol, veh/h		922			214			1254			444	
Approach Delay, s/veh		140.1			45.3			37.1			46.7	
Approach LOS		F			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	47.9		32.0	35.5	21.9		15.9
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	11.0	45.5		28.0	35.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	6.3	21.3		30.0	30.2	13.1		9.4
Green Ext Time (p_c), s	0.0	4.1		0.0	0.8	2.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	72.8
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	30	20	65	10	460	20	755	105	555	675	15
Future Volume (veh/h)	15	30	20	65	10	460	20	755	105	555	675	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1837	1845	1900	1845	1827	1863	1864	1900
Adj Flow Rate, veh/h	16	32	21	69	11	489	21	803	112	590	718	16
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	3	0	3	4	2	2	2
Cap, veh/h	42	74	37	145	20	734	26	821	685	597	1392	31
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.01	0.44	0.44	0.34	0.77	0.77
Sat Flow, veh/h	76	561	279	734	149	1556	1810	1845	1539	1774	1815	40
Grp Volume(v), veh/h	69	0	0	80	0	489	21	803	112	590	0	734
Grp Sat Flow(s),veh/h/ln	916	0	0	883	0	1556	1810	1845	1539	1774	0	1855
Q Serve(g_s), s	0.4	0.0	0.0	0.0	0.0	18.5	1.6	59.7	6.1	46.1	0.0	21.3
Cycle Q Clear(g_c), s	14.7	0.0	0.0	14.5	0.0	18.5	1.6	59.7	6.1	46.1	0.0	21.3
Prop In Lane	0.23		0.30	0.86		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	153	0	0	165	0	734	26	821	685	597	0	1423
V/C Ratio(X)	0.45	0.00	0.00	0.48	0.00	0.67	0.80	0.98	0.16	0.99	0.00	0.52
Avail Cap(c_a), veh/h	153	0	0	165	0	734	75	826	689	597	0	1423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.9	0.0	0.0	58.6	0.0	28.7	68.6	38.1	23.2	46.0	0.0	6.3
Incr Delay (d2), s/veh	2.1	0.0	0.0	2.2	0.0	2.3	18.7	25.9	0.1	33.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	3.1	0.0	15.0	0.9	36.3	2.6	28.2	0.0	10.9
LnGrp Delay(d),s/veh	56.9	0.0	0.0	60.8	0.0	31.0	87.3	64.0	23.3	79.6	0.0	6.6
LnGrp LOS	E			E		C	F	E	C	E		A
Approach Vol, veh/h		69			569			936			1324	
Approach Delay, s/veh		56.9			35.2			59.7			39.1	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	51.0	66.1		22.5	6.0	111.1		22.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	47.0	62.5		18.5	5.8	103.7		18.5
Max Q Clear Time (g_c+I1), s	48.1	61.7		16.7	3.6	23.3		20.5
Green Ext Time (p_c), s	0.0	0.4		0.6	0.0	20.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.4
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	35	60	85	50	75	215	805	155	50	205	575
Future Volume (veh/h)	70	35	60	85	50	75	215	805	155	50	205	575
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1877	1900	1827	1850	1900	1900	1845	1863
Adj Flow Rate, veh/h	74	37	64	90	53	80	229	856	165	53	218	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	0	0	4	3	3	0	3	2
Cap, veh/h	136	68	183	214	81	122	287	1217	235	96	557	478
Arrive On Green	0.11	0.11	0.11	0.12	0.12	0.12	0.16	0.41	0.41	0.05	0.30	0.00
Sat Flow, veh/h	1202	601	1615	1792	676	1021	1740	2941	567	1810	1845	1583
Grp Volume(v), veh/h	111	0	64	90	0	133	229	512	509	53	218	0
Grp Sat Flow(s),veh/h/ln	1803	0	1615	1792	0	1697	1740	1758	1750	1810	1845	1583
Q Serve(g_s), s	2.8	0.0	1.7	2.2	0.0	3.6	6.0	11.5	11.5	1.4	4.5	0.0
Cycle Q Clear(g_c), s	2.8	0.0	1.7	2.2	0.0	3.6	6.0	11.5	11.5	1.4	4.5	0.0
Prop In Lane	0.67		1.00	1.00		0.60	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	183	214	0	203	287	727	724	96	557	478
V/C Ratio(X)	0.54	0.00	0.35	0.42	0.00	0.66	0.80	0.70	0.70	0.55	0.39	0.00
Avail Cap(c_a), veh/h	965	0	865	692	0	656	713	1300	1294	251	864	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	0.0	19.5	19.4	0.0	20.0	19.1	11.5	11.5	22.0	13.2	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.4	0.5	0.0	1.3	2.0	0.7	0.7	1.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.8	1.1	0.0	1.7	3.0	5.7	5.7	0.7	2.3	0.0
LnGrp Delay(d),s/veh	20.8	0.0	19.9	19.9	0.0	21.4	21.1	12.2	12.2	23.8	13.4	0.0
LnGrp LOS	C		B	B		C	C	B	B	C	B	
Approach Vol, veh/h		175			223			1250			271	
Approach Delay, s/veh		20.4			20.8			13.8			15.4	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	23.4		8.9	10.8	18.1		9.8
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.6	35.2		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	3.4	13.5		4.8	8.0	6.5		5.6
Green Ext Time (p_c), s	0.0	6.2		0.4	0.2	5.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	379.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	305	530	645	325	100	250
Future Vol, veh/h	305	530	645	325	100	250
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	3	3	2	4	1
Mvmt Flow	328	570	694	349	108	269

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1178	694	0	0	694	0
Stage 1	694	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.41	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	~ 212	~ 441	-	-	892	-
Stage 1	498	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 182	~ 441	-	-	892	-
Mov Cap-2 Maneuver	~ 182	-	-	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s$	978.6	0	2.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	290	892	-
HCM Lane V/C Ratio	-	-	3.096	0.121	-
HCM Control Delay (s)	-	-	$ 978.6	9.6	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	80.2	0.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	585	60	55	180	35	155
Future Vol, veh/h	585	60	55	180	35	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	6	5	4
Mvmt Flow	636	65	60	196	38	168

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	701	0	983	668
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	-	-	4.12	-	6.45	6.24
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.336
Pot Cap-1 Maneuver	-	-	896	-	272	455
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	733	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	896	-	252	455
Mov Cap-2 Maneuver	-	-	-	-	252	-
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	23.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	396	-	-	896	-
HCM Lane V/C Ratio	0.522	-	-	0.067	-
HCM Control Delay (s)	23.6	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.9	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	320	240	495	190	70	130	1470	550	35	940	70
Future Volume (veh/h)	135	320	240	495	190	70	130	1470	550	35	940	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1827	1845	1845	1863	1810	1810	1881	1845	1743	1863	1810
Adj Flow Rate, veh/h	147	348	261	538	207	76	141	1598	598	38	1022	76
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	4	3	3	2	5	5	1	3	9	2	5
Cap, veh/h	174	349	299	550	475	387	165	1657	980	47	1402	759
Arrive On Green	0.10	0.19	0.19	0.16	0.25	0.25	0.10	0.46	0.46	0.03	0.40	0.40
Sat Flow, veh/h	1792	1827	1568	3408	1863	1518	1723	3574	1568	1660	3539	1538
Grp Volume(v), veh/h	147	348	261	538	207	76	141	1598	598	38	1022	76
Grp Sat Flow(s),veh/h/ln	1792	1827	1568	1704	1863	1518	1723	1787	1568	1660	1770	1538
Q Serve(g_s), s	10.4	24.4	20.7	20.2	12.0	5.0	10.3	55.7	29.7	2.9	31.5	3.4
Cycle Q Clear(g_c), s	10.4	24.4	20.7	20.2	12.0	5.0	10.3	55.7	29.7	2.9	31.5	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	349	299	550	475	387	165	1657	980	47	1402	759
V/C Ratio(X)	0.84	1.00	0.87	0.98	0.44	0.20	0.85	0.96	0.61	0.80	0.73	0.10
Avail Cap(c_a), veh/h	262	349	299	550	475	387	195	1665	983	65	1402	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.0	51.9	50.4	53.6	40.1	37.5	57.1	33.4	14.6	62.0	32.9	17.3
Incr Delay (d2), s/veh	14.4	47.7	24.8	32.9	1.3	0.5	25.7	14.7	1.6	38.6	2.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	16.9	11.0	12.0	6.3	2.2	6.1	30.7	13.3	1.8	15.8	1.5
LnGrp Delay(d),s/veh	71.4	99.6	75.2	86.6	41.4	38.0	82.8	48.0	16.2	100.6	35.3	17.5
LnGrp LOS	E	F	E	F	D	D	F	D	B	F	D	B
Approach Vol, veh/h		756			821			2337			1136	
Approach Delay, s/veh		85.7			70.7			42.0			36.3	
Approach LOS		F			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	65.0	25.2	30.0	16.8	56.4	17.0	38.2
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	59.8	20.7	24.5	14.5	50.3	18.8	26.4
Max Q Clear Time (g_c+I1), s	4.9	57.7	22.2	26.4	12.3	33.5	12.4	14.0
Green Ext Time (p_c), s	0.0	1.9	0.0	0.0	0.1	16.7	0.2	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	51.9
HCM 2010 LOS	D

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	545	105	0	130	0	2045	375	315	1245	115
Future Volume (vph)	0	0	545	105	0	130	0	2045	375	315	1245	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.91	
Frpb, ped/bikes			0.99	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	0.99		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.98		1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1603	1759		1553		3467		1787	5029	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1603	1759		1553		3467		1787	5029	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	568	109	0	135	0	2130	391	328	1297	120
RTOR Reduction (vph)	0	0	77	0	0	105	0	10	0	0	7	0
Lane Group Flow (vph)	0	0	491	109	0	30	0	2511	0	328	1410	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	
Protected Phases								6		5	2	
Permitted Phases			4	8		8						
Actuated Green, G (s)			33.0	33.0		33.0		82.5		21.0	107.5	
Effective Green, g (s)			33.0	33.0		33.0		82.5		21.0	107.5	
Actuated g/C Ratio			0.22	0.22		0.22		0.55		0.14	0.72	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			352	386		341		1906		250	3604	
v/s Ratio Prot								c0.72		c0.18	0.28	
v/s Ratio Perm			c0.31	0.06		0.02						
v/c Ratio			1.39	0.28		0.09		1.32		1.31	0.39	
Uniform Delay, d1			58.5	48.7		46.5		33.8		64.5	8.4	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			194.0	0.5		0.2		146.7		166.0	0.1	
Delay (s)			252.5	49.2		46.7		180.4		230.5	8.5	
Level of Service			F	D		D		F		F	A	
Approach Delay (s)		252.5			47.8			180.4			50.2	
Approach LOS		F			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	137.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	103.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	415	25	285	120	30	90	220	1865	55	100	1560	185
Future Volume (veh/h)	415	25	285	120	30	90	220	1865	55	100	1560	185
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1863	1863	1863	1881
Adj Flow Rate, veh/h	441	27	303	128	32	96	234	1984	59	106	1660	197
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	372	380	569	154	165	138	259	1820	813	98	2132	661
Arrive On Green	0.21	0.21	0.21	0.09	0.09	0.09	0.15	0.51	0.51	0.06	0.42	0.42
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	3539	1582	1774	5085	1577
Grp Volume(v), veh/h	441	27	303	128	32	96	234	1984	59	106	1660	197
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1770	1582	1774	1695	1577
Q Serve(g_s), s	26.0	1.5	12.5	9.1	2.1	7.7	16.9	65.0	2.4	7.0	35.6	10.5
Cycle Q Clear(g_c), s	26.0	1.5	12.5	9.1	2.1	7.7	16.9	65.0	2.4	7.0	35.6	10.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	372	380	569	154	165	138	259	1820	813	98	2132	661
V/C Ratio(X)	1.18	0.07	0.53	0.83	0.19	0.70	0.90	1.09	0.07	1.08	0.78	0.30
Avail Cap(c_a), veh/h	372	538	804	261	434	362	282	1820	813	98	2132	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	40.2	44.6	56.7	53.2	55.8	52.8	30.7	15.5	59.7	31.6	24.4
Incr Delay (d2), s/veh	107.2	0.1	0.8	10.7	0.6	6.3	28.7	50.2	0.1	113.8	2.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.0	0.8	4.8	4.9	1.1	3.5	10.1	44.3	1.1	6.5	17.0	4.7
LnGrp Delay(d),s/veh	157.5	40.3	45.4	67.4	53.8	62.1	81.5	80.9	15.6	173.7	33.9	24.9
LnGrp LOS	F	D	D	E	D	E	F	F	B	F	C	C
Approach Vol, veh/h		771			256			2277			1963	
Approach Delay, s/veh		109.3			63.7			79.3			40.5	
Approach LOS		F			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	70.0	15.1	30.3	23.0	58.0	30.0	15.4
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	65.0	18.8	37.2	20.7	51.3	26.0	30.0
Max Q Clear Time (g_c+I1), s	9.0	67.0	11.1	14.5	18.9	37.6	28.0	9.7
Green Ext Time (p_c), s	0.0	0.0	0.2	1.8	0.1	13.7	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	68.5
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	120	1035	70	240	305	1835	255	0	1930	35
Future Volume (veh/h)	35	0	120	1035	70	240	305	1835	255	0	1930	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1832	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	37	0	128	1101	210	164	324	1952	271	0	2053	37
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	49	0	0	1146	482	405	285	2995	942	0	1966	642
Arrive On Green	0.03	0.00	0.00	0.33	0.26	0.26	0.32	1.00	1.00	0.00	0.40	0.40
Sat Flow, veh/h	1810	37		3514	1832	1538	1792	5036	1583	0	5055	1599
Grp Volume(v), veh/h	37	87.5		1101	210	164	324	1952	271	0	2053	37
Grp Sat Flow(s),veh/h/ln	1810	F		1757	1832	1538	1792	1679	1583	0	1631	1599
Q Serve(g_s), s	2.8			43.1	13.4	12.3	22.3	0.0	0.0	0.0	56.3	2.0
Cycle Q Clear(g_c), s	2.8			43.1	13.4	12.3	22.3	0.0	0.0	0.0	56.3	2.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	49			1146	482	405	285	2995	942	0	1966	642
V/C Ratio(X)	0.75			0.96	0.44	0.41	1.14	0.65	0.29	0.00	1.04	0.06
Avail Cap(c_a), veh/h	65			1230	510	428	285	2995	942	0	1966	642
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.62	0.62
Uniform Delay (d), s/veh	67.6			46.3	42.9	42.5	47.7	0.0	0.0	0.0	41.9	25.6
Incr Delay (d2), s/veh	19.9			16.2	0.2	0.2	94.9	1.1	0.8	0.0	29.1	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7			23.5	6.8	5.3	18.5	0.3	0.2	0.0	30.6	0.9
LnGrp Delay(d),s/veh	87.5			62.5	43.2	42.8	142.6	1.1	0.8	0.0	71.0	25.7
LnGrp LOS	F			E	D	D	F	A	A		F	C
Approach Vol, veh/h					1475			2547			2090	
Approach Delay, s/veh					57.6			19.1			70.2	
Approach LOS					E			B			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		89.5	50.5		27.0	62.5	8.4	42.1
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		79.9	49.0		* 22	52.9	5.0	39.0
Max Q Clear Time (g_c+I1), s		2.0	45.1		24.3	58.3	4.8	15.4
Green Ext Time (p_c), s		35.2	0.6		0.0	0.0	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	46.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	520	180	100	125	0	310	0	2430	160	270	1525	360
Future Volume (veh/h)	520	180	100	125	0	310	0	2430	160	270	1525	360
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1881	0	1881	0	1827	1900	1881	1845	1881
Adj Flow Rate, veh/h	547	189	105	132	0	326	0	2558	168	284	1605	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	1	0	1	0	4	0	1	3	1
Cap, veh/h	664	299	131	138	0	0	0	2478	637	1013	2558	1167
Arrive On Green	0.19	0.08	0.08	0.08	0.00	0.00	0.00	0.39	0.39	0.29	0.73	0.00
Sat Flow, veh/h	3442	3610	1583	1792	132		0	6540	1615	3476	3505	1599
Grp Volume(v), veh/h	547	189	105	132	126.6		0	2558	168	284	1605	0
Grp Sat Flow(s),veh/h/ln	1721	1805	1583	1792	F		0	1571	1615	1738	1752	1599
Q Serve(g_s), s	21.4	7.1	9.1	10.3			0.0	55.2	7.3	8.8	31.9	0.0
Cycle Q Clear(g_c), s	21.4	7.1	9.1	10.3			0.0	55.2	7.3	8.8	31.9	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	664	299	131	138			0	2478	637	1013	2558	1167
V/C Ratio(X)	0.82	0.63	0.80	0.96			0.00	1.03	0.26	0.28	0.63	0.00
Avail Cap(c_a), veh/h	762	1083	475	138			0	2478	637	1013	2558	1167
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.77	0.77	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.2	62.1	63.1	64.4			0.0	42.4	15.9	38.3	9.4	0.0
Incr Delay (d2), s/veh	6.2	0.8	4.2	62.3			0.0	25.0	0.8	0.1	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.8	3.6	4.1	7.5			0.0	28.2	3.4	4.3	15.8	0.0
LnGrp Delay(d),s/veh	60.4	62.9	67.2	126.6			0.0	67.4	16.7	38.3	10.6	0.0
LnGrp LOS	E	E	E	F				F	B	D	B	
Approach Vol, veh/h		841						2726			1889	
Approach Delay, s/veh		61.8						64.2			14.8	
Approach LOS		E						E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	47.0	61.4	15.4	16.2		108.4	31.6	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	12.0	* 55	10.8	42.0		71.8	31.0	
Max Q Clear Time (g_c+I1), s	10.8	57.2	12.3	11.1		33.9	23.4	
Green Ext Time (p_c), s	0.1	0.0	0.0	0.5		6.3	1.1	

Intersection Summary	
HCM 2010 Ctrl Delay	48.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	10	65	25	5	75	55	2360	65	0	1560	190
Future Volume (veh/h)	155	10	65	25	5	75	55	2360	65	0	1560	190
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1894	1881	1863	1863	1900	0	1863	1863
Adj Flow Rate, veh/h	168	11	71	27	5	82	60	2565	71	0	1696	207
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	1	2	2	2	0	2	2
Cap, veh/h	204	25	161	105	19	110	77	4481	124	0	2157	965
Arrive On Green	0.11	0.11	0.11	0.07	0.07	0.07	0.04	0.69	0.69	0.00	0.61	0.61
Sat Flow, veh/h	1774	217	1399	1533	284	1599	1774	6458	178	0	3632	1583
Grp Volume(v), veh/h	168	0	82	32	0	82	60	1908	728	0	1696	207
Grp Sat Flow(s),veh/h/ln	1774	0	1616	1817	0	1599	1774	1602	1831	0	1770	1583
Q Serve(g_s), s	10.2	0.0	5.2	1.8	0.0	5.5	3.7	22.2	22.2	0.0	39.5	6.5
Cycle Q Clear(g_c), s	10.2	0.0	5.2	1.8	0.0	5.5	3.7	22.2	22.2	0.0	39.5	6.5
Prop In Lane	1.00		0.87	0.84		1.00	1.00		0.10	0.00		1.00
Lane Grp Cap(c), veh/h	204	0	186	125	0	110	77	3335	1271	0	2157	965
V/C Ratio(X)	0.82	0.00	0.44	0.26	0.00	0.75	0.78	0.57	0.57	0.00	0.79	0.21
Avail Cap(c_a), veh/h	290	0	264	297	0	262	81	3335	1271	0	2157	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.10	0.10	0.10	0.00	0.72	0.72
Uniform Delay (d), s/veh	47.6	0.0	45.4	48.6	0.0	50.3	52.1	8.5	8.6	0.0	16.1	9.6
Incr Delay (d2), s/veh	12.2	0.0	1.6	1.1	0.0	9.7	4.6	0.1	0.2	0.0	2.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	2.4	1.0	0.0	2.7	1.9	9.7	11.2	0.0	19.7	2.9
LnGrp Delay(d),s/veh	59.8	0.0	47.0	49.7	0.0	60.0	56.7	8.6	8.7	0.0	18.3	10.0
LnGrp LOS	E		D	D		E	E	A	A		B	B
Approach Vol, veh/h		250			114			2696			1903	
Approach Delay, s/veh		55.6			57.1			9.7			17.4	
Approach LOS		E			E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		80.8		17.1	9.3	71.6		12.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		60.5		18.0	5.0	51.0		18.0
Max Q Clear Time (g_c+I1), s		24.2		12.2	5.7	41.5		7.5
Green Ext Time (p_c), s		35.5		0.5	0.0	9.4		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	55	485	155	100	15	295	2260	185	100	1445	105
Future Volume (veh/h)	205	55	485	155	100	15	295	2260	185	100	1445	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1776	1900	1900	1900	1863	1863	1696	1881	1900
Adj Flow Rate, veh/h	223	60	527	168	109	16	321	2457	201	109	1571	114
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	7	0	0	0	2	2	12	1	0
Cap, veh/h	187	522	444	203	443	377	271	2360	734	109	1363	615
Arrive On Green	0.10	0.27	0.27	0.06	0.23	0.23	0.15	0.46	0.46	0.07	0.38	0.38
Sat Flow, veh/h	1810	1900	1615	3281	1900	1615	1810	5085	1582	1616	3574	1614
Grp Volume(v), veh/h	223	60	527	168	109	16	321	2457	201	109	1571	114
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1640	1900	1615	1810	1695	1582	1616	1787	1614
Q Serve(g_s), s	15.5	3.5	41.2	7.6	7.0	1.2	22.5	69.6	11.7	10.1	57.2	7.1
Cycle Q Clear(g_c), s	15.5	3.5	41.2	7.6	7.0	1.2	22.5	69.6	11.7	10.1	57.2	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	187	522	444	203	443	377	271	2360	734	109	1363	615
V/C Ratio(X)	1.19	0.11	1.19	0.83	0.25	0.04	1.18	1.04	0.27	1.00	1.15	0.19
Avail Cap(c_a), veh/h	187	522	444	203	443	377	271	2360	734	109	1363	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.3	40.7	54.4	69.5	46.8	44.5	63.7	40.2	24.7	69.9	46.4	30.9
Incr Delay (d2), s/veh	127.3	0.1	105.2	23.5	0.3	0.1	113.3	30.4	0.2	86.8	77.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	1.9	31.3	4.1	3.7	0.5	19.8	39.2	5.2	7.1	42.9	3.2
LnGrp Delay(d),s/veh	194.5	40.9	159.6	93.0	47.1	44.6	177.1	70.6	24.9	156.8	123.9	31.1
LnGrp LOS	F	D	F	F	D	D	F	F	C	F	F	C
Approach Vol, veh/h		810			293			2979			1794	
Approach Delay, s/veh		160.4			73.3			79.0			120.0	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	75.4	13.8	46.2	27.0	63.0	20.0	40.0
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	10.1	69.6	9.3	41.2	22.5	57.2	15.5	35.0
Max Q Clear Time (g_c+I1), s	12.1	71.6	9.6	43.2	24.5	59.2	17.5	9.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	102.4
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	285	175	60	2435	1945	175
Future Volume (veh/h)	285	175	60	2435	1945	175
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1866	1900
Adj Flow Rate, veh/h	300	184	63	2563	2047	184
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2
Cap, veh/h	500	230	82	2645	3112	277
Arrive On Green	0.14	0.14	0.05	0.75	0.65	0.65
Sat Flow, veh/h	3510	1615	1810	3632	4929	425
Grp Volume(v), veh/h	300	184	63	2563	1455	776
Grp Sat Flow(s),veh/h/ln	1755	1615	1810	1770	1698	1790
Q Serve(g_s), s	7.4	10.2	3.2	61.4	24.1	24.5
Cycle Q Clear(g_c), s	7.4	10.2	3.2	61.4	24.1	24.5
Prop In Lane	1.00	1.00	1.00			0.24
Lane Grp Cap(c), veh/h	500	230	82	2645	2219	1170
V/C Ratio(X)	0.60	0.80	0.77	0.97	0.66	0.66
Avail Cap(c_a), veh/h	702	323	176	2726	2219	1170
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	38.4	43.7	10.7	9.7	9.8
Incr Delay (d2), s/veh	1.2	9.2	14.0	10.9	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.2	1.9	33.2	11.3	12.3
LnGrp Delay(d),s/veh	38.4	47.7	57.7	21.6	10.5	11.3
LnGrp LOS	D	D	E	C	B	B
Approach Vol, veh/h	484			2626	2231	
Approach Delay, s/veh	41.9			22.5	10.8	
Approach LOS	D			C	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		17.7	8.7	66.2				74.9
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	9.0	57.8				71.3
Max Q Clear Time (g_c+I1), s		12.2	5.2	26.5				63.4
Green Ext Time (p_c), s		1.0	0.0	31.2				5.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	320	625	105	240	210	485	1955	110	325	1600	225
Future Volume (veh/h)	330	320	625	105	240	210	485	1955	110	325	1600	225
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1845	1900	1900	1810	1900	1863	1863	1900	1863	1863	1845
Adj Flow Rate, veh/h	355	344	672	113	258	226	522	2102	118	349	1720	242
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	0	0	5	5	2	2	2	2	2	3
Cap, veh/h	259	846	385	112	277	232	573	1457	81	245	2029	613
Arrive On Green	0.14	0.24	0.24	0.06	0.16	0.16	0.17	0.43	0.43	0.14	0.40	0.40
Sat Flow, veh/h	1792	3505	1595	1810	1748	1465	3442	3408	189	1774	5085	1538
Grp Volume(v), veh/h	355	344	672	113	254	230	522	1082	1138	349	1720	242
Grp Sat Flow(s),veh/h/ln	1792	1752	1595	1810	1719	1494	1721	1770	1828	1774	1695	1538
Q Serve(g_s), s	21.0	12.0	35.0	9.0	21.1	22.3	21.6	62.0	62.0	20.0	44.5	16.3
Cycle Q Clear(g_c), s	21.0	12.0	35.0	9.0	21.1	22.3	21.6	62.0	62.0	20.0	44.5	16.3
Prop In Lane	1.00		1.00	1.00		0.98	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	259	846	385	112	273	237	573	757	782	245	2029	613
V/C Ratio(X)	1.37	0.41	1.75	1.01	0.93	0.97	0.91	1.43	1.46	1.43	0.85	0.39
Avail Cap(c_a), veh/h	259	846	385	112	273	237	593	757	782	245	2029	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.0	46.3	55.0	68.0	60.2	60.7	59.4	41.5	41.5	62.5	39.6	31.1
Incr Delay (d2), s/veh	188.3	1.1	346.1	86.6	36.6	50.7	18.9	200.8	212.6	213.9	3.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.0	5.9	52.4	7.2	12.8	12.6	11.8	72.5	77.4	24.3	21.6	7.0
LnGrp Delay(d),s/veh	250.3	47.4	401.1	154.6	96.8	111.4	78.2	242.3	254.1	276.4	43.3	31.7
LnGrp LOS	F	D	F	F	F	F	E	F	F	F	D	C
Approach Vol, veh/h		1371			597			2742			2311	
Approach Delay, s/veh		273.3			113.3			216.0			77.3	
Approach LOS		F			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	67.0	13.0	41.0	28.2	62.8	25.0	29.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	62.0	9.0	35.0	25.0	57.0	21.0	23.0
Max Q Clear Time (g_c+I1), s	22.0	64.0	11.0	37.0	23.6	46.5	23.0	24.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.6	10.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	172.8
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	170	380	130	105	55	155	1030	235	45	510	25
Future Volume (veh/h)	140	170	380	130	105	55	155	1030	235	45	510	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1724	1845	1900	1743	1792	1681	1848	1900	1900	1827	1624
Adj Flow Rate, veh/h	154	187	418	143	115	60	170	1132	258	49	560	27
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	12	12	3	9	9	6	13	3	3	0	4	17
Cap, veh/h	35	0	486	37	0	472	192	818	186	63	870	643
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.12	0.56	0.56	0.03	0.48	0.48
Sat Flow, veh/h	0	0	1565	0	0	1522	1601	1457	332	1810	1827	1350
Grp Volume(v), veh/h	341	0	418	258	0	60	170	0	1390	49	560	27
Grp Sat Flow(s),veh/h/ln	0	0	1565	0	0	1522	1601	0	1789	1810	1827	1350
Q Serve(g_s), s	0.0	0.0	37.6	0.0	0.0	4.2	15.7	0.0	84.1	4.0	34.7	1.6
Cycle Q Clear(g_c), s	46.5	0.0	37.6	46.5	0.0	4.2	15.7	0.0	84.1	4.0	34.7	1.6
Prop In Lane	0.45		1.00	0.55		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	35	0	486	37	0	472	192	0	1004	63	870	643
V/C Ratio(X)	9.78	0.00	0.86	6.91	0.00	0.13	0.89	0.00	1.38	0.77	0.64	0.04
Avail Cap(c_a), veh/h	35	0	486	37	0	472	273	0	1004	65	870	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	74.9	0.0	48.6	74.9	0.0	37.1	64.9	0.0	32.9	71.7	29.6	21.0
Incr Delay (d2), s/veh	4006.6	0.0	14.7	2714.3	0.0	0.1	22.1	0.0	179.2	43.0	2.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	40.2	0.0	18.3	29.7	0.0	1.8	8.1	0.0	91.3	2.8	18.1	0.6
LnGrp Delay(d),s/veh	4081.5	0.0	63.3	2789.2	0.0	37.2	87.0	0.0	212.0	114.7	32.2	21.0
LnGrp LOS	F		E	F		D	F		F	F	C	C
Approach Vol, veh/h		759			318			1560			636	
Approach Delay, s/veh		1868.6			2270.0			198.4			38.1	
Approach LOS		F			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	89.5		51.0	22.1	76.8		51.0
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.4	84.1		46.5	25.5	64.0		46.5
Max Q Clear Time (g_c+I1), s	6.0	86.1		48.5	17.7	36.7		48.5
Green Ext Time (p_c), s	0.0	0.0		0.0	0.3	26.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	755.8
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	240	50	830	145	295	50	765	840	190	825	30
Future Volume (veh/h)	60	240	50	830	145	295	50	765	840	190	825	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1839	1900	1881	1870	1900	1900	1845	1881	1900	1861	1900
Adj Flow Rate, veh/h	64	255	53	993	0	314	53	814	894	202	878	32
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	1	3	0	0	3	1	0	2	2
Cap, veh/h	211	350	72	1019	0	457	69	1262	575	182	1470	54
Arrive On Green	0.12	0.12	0.12	0.28	0.00	0.28	0.04	0.36	0.36	0.10	0.42	0.42
Sat Flow, veh/h	1740	2884	589	3583	0	1606	1810	3505	1596	1810	3476	127
Grp Volume(v), veh/h	64	153	155	993	0	314	53	814	894	202	447	463
Grp Sat Flow(s),veh/h/ln	1740	1747	1726	1792	0	1606	1810	1752	1596	1810	1768	1835
Q Serve(g_s), s	4.7	11.7	12.1	38.1	0.0	24.1	4.0	26.9	50.0	14.0	27.1	27.1
Cycle Q Clear(g_c), s	4.7	11.7	12.1	38.1	0.0	24.1	4.0	26.9	50.0	14.0	27.1	27.1
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	211	212	210	1019	0	457	69	1262	575	182	748	776
V/C Ratio(X)	0.30	0.72	0.74	0.97	0.00	0.69	0.77	0.64	1.56	1.11	0.60	0.60
Avail Cap(c_a), veh/h	351	352	348	1019	0	457	117	1262	575	182	748	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	58.7	58.9	49.2	0.0	44.2	66.2	37.0	44.4	62.4	30.9	30.9
Incr Delay (d2), s/veh	0.8	4.5	5.1	22.1	0.0	4.3	16.5	1.3	258.4	98.3	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	5.9	6.0	22.0	0.0	11.2	2.3	13.2	63.1	11.9	13.5	14.0
LnGrp Delay(d),s/veh	56.4	63.3	64.0	71.2	0.0	48.5	82.7	38.3	302.8	160.7	32.5	32.4
LnGrp LOS	E	E	E	E		D	F	D	F	F	C	C
Approach Vol, veh/h		372			1307			1761			1112	
Approach Delay, s/veh		62.4			65.8			173.9			55.8	
Approach LOS		E			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	55.0		21.9	9.3	63.7		44.0
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	14.0	50.0		28.0	9.0	55.0		39.5
Max Q Clear Time (g_c+I1), s	16.0	52.0		14.1	6.0	29.1		40.1
Green Ext Time (p_c), s	0.0	0.0		1.6	0.0	22.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	104.9
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	1140	25	35	1095	515	55	20	15	490	20	250
Future Volume (veh/h)	320	1140	25	35	1095	515	55	20	15	490	20	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1845	1881	1776	1900	1900	1900	1863	1866	1900
Adj Flow Rate, veh/h	333	1188	26	36	1141	0	57	21	16	525	0	260
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	3	1	7	0	0	0	2	0	0
Cap, veh/h	350	1749	38	45	1147	485	131	72	55	772	0	349
Arrive On Green	0.19	0.49	0.49	0.03	0.32	0.00	0.07	0.07	0.07	0.22	0.00	0.22
Sat Flow, veh/h	1810	3577	78	1757	3574	1509	1810	994	757	3548	0	1606
Grp Volume(v), veh/h	333	594	620	36	1141	0	57	0	37	525	0	260
Grp Sat Flow(s),veh/h/ln	1810	1788	1867	1757	1787	1509	1810	0	1751	1774	0	1606
Q Serve(g_s), s	18.1	25.3	25.3	2.0	31.7	0.0	3.0	0.0	2.0	13.5	0.0	15.1
Cycle Q Clear(g_c), s	18.1	25.3	25.3	2.0	31.7	0.0	3.0	0.0	2.0	13.5	0.0	15.1
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.43	1.00		1.00
Lane Grp Cap(c), veh/h	350	874	913	45	1147	485	131	0	126	772	0	349
V/C Ratio(X)	0.95	0.68	0.68	0.80	0.99	0.00	0.44	0.00	0.29	0.68	0.00	0.74
Avail Cap(c_a), veh/h	350	874	913	90	1147	485	131	0	126	1139	0	516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.7	19.5	19.5	48.3	33.8	0.0	44.3	0.0	43.8	35.8	0.0	36.4
Incr Delay (d2), s/veh	35.2	3.7	3.5	27.0	25.2	0.0	10.2	0.0	5.8	1.5	0.0	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	13.3	13.8	1.3	19.6	0.0	1.9	0.0	1.2	6.8	0.0	7.1
LnGrp Delay(d),s/veh	75.0	23.1	23.0	75.3	59.0	0.0	54.5	0.0	49.6	37.3	0.0	40.9
LnGrp LOS	E	C	C	E	E		D		D	D		D
Approach Vol, veh/h		1547			1177			94			785	
Approach Delay, s/veh		34.2			59.5			52.6			38.5	
Approach LOS		C			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.2	7.0	53.8		26.7	23.8	37.0
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.2	5.1	46.2		32.0	19.3	32.0
Max Q Clear Time (g_c+I1), s		5.0	4.0	27.3		17.1	20.1	33.7
Green Ext Time (p_c), s		0.1	0.0	18.4		4.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.9
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1125	535	640	1355	0	0	0	0	70	5	330
Future Volume (veh/h)	0	1125	535	640	1355	0	0	0	0	70	5	330
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1863	1863	1827	0				1900	1863	1900
Adj Flow Rate, veh/h	0	1184	563	674	1426	0				74	5	347
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	2	4	0				0	0	0
Cap, veh/h	0	1223	540	677	2650	0				309	4	267
Arrive On Green	0.00	0.34	0.34	0.38	0.76	0.00				0.17	0.17	0.17
Sat Flow, veh/h	0	3668	1579	1774	3563	0				1810	23	1565
Grp Volume(v), veh/h	0	1184	563	674	1426	0				74	0	352
Grp Sat Flow(s),veh/h/ln	0	1787	1579	1774	1736	0				1810	0	1587
Q Serve(g_s), s	0.0	45.6	47.9	53.1	23.1	0.0				5.0	0.0	23.9
Cycle Q Clear(g_c), s	0.0	45.6	47.9	53.1	23.1	0.0				5.0	0.0	23.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1223	540	677	2650	0				309	0	271
V/C Ratio(X)	0.00	0.97	1.04	1.00	0.54	0.00				0.24	0.00	1.30
Avail Cap(c_a), veh/h	0	1223	540	677	2650	0				309	0	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.67	0.67	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	45.3	46.0	43.2	6.6	0.0				50.2	0.0	58.1
Incr Delay (d2), s/veh	0.0	14.8	43.2	9.5	0.1	0.0				0.1	0.0	159.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.0	27.3	27.8	10.9	0.0				2.5	0.0	22.4
LnGrp Delay(d),s/veh	0.0	60.1	89.2	52.7	6.7	0.0				50.3	0.0	217.1
LnGrp LOS		E	F	D	A					D		F
Approach Vol, veh/h		1747			2100						426	
Approach Delay, s/veh		69.5			21.5						188.1	
Approach LOS		E			C						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	59.0	53.0		28.0		112.0		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	53.4	47.9		23.9		106.9		
Max Q Clear Time (g_c+I1), s	55.1	49.9		25.9		25.1		
Green Ext Time (p_c), s	0.0	0.0		0.0		34.7		

Intersection Summary	
HCM 2010 Ctrl Delay	57.7
HCM 2010 LOS	E

HCM 2010 Signalized Intersection Summary
19: I-80 EB Ramps & Rocklin Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	885	0	0	1550	135	445	5	570	0	0	0
Future Volume (veh/h)	310	885	0	0	1550	135	445	5	570	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1810	1848	1863			
Adj Flow Rate, veh/h	337	962	0	0	1685	147	700	0	392			
Adj No. of Lanes	1	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	1	0	0	1	1	5	0	2			
Cap, veh/h	328	2445	0	0	1658	742	789	0	363			
Arrive On Green	0.19	0.68	0.00	0.00	0.46	0.46	0.23	0.00	0.23			
Sat Flow, veh/h	1774	3668	0	0	3668	1599	3447	0	1583			
Grp Volume(v), veh/h	337	962	0	0	1685	147	700	0	392			
Grp Sat Flow(s),veh/h/ln	1774	1787	0	0	1787	1599	1723	0	1583			
Q Serve(g_s), s	18.5	11.6	0.0	0.0	46.4	5.4	19.6	0.0	22.9			
Cycle Q Clear(g_c), s	18.5	11.6	0.0	0.0	46.4	5.4	19.6	0.0	22.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	328	2445	0	0	1658	742	789	0	363			
V/C Ratio(X)	1.03	0.39	0.00	0.00	1.02	0.20	0.89	0.00	1.08			
Avail Cap(c_a), veh/h	328	2445	0	0	1658	742	789	0	363			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.26	0.26	0.00	0.00	0.66	0.66	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.8	6.8	0.0	0.0	26.8	15.8	37.3	0.0	38.5			
Incr Delay (d2), s/veh	32.4	0.1	0.0	0.0	22.1	0.4	12.2	0.0	70.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.0	5.7	0.0	0.0	27.9	2.4	10.7	0.0	17.1			
LnGrp Delay(d),s/veh	73.1	7.0	0.0	0.0	48.9	16.2	49.5	0.0	109.2			
LnGrp LOS	F	A			F	B	D		F			
Approach Vol, veh/h		1299			1832			1092				
Approach Delay, s/veh		24.1			46.2			70.9				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		73.0			22.0	51.0		27.0
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		68.4			18.5	46.4		22.9
Max Q Clear Time (g_c+I1), s		13.6			20.5	48.4		24.9
Green Ext Time (p_c), s		27.5			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1060	340	55	1440	0	250	0	55	0	0	0
Future Volume (veh/h)	55	1060	340	55	1440	0	250	0	55	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1858	1900	1900	1863	0	1827	0	1810			
Adj Flow Rate, veh/h	60	1165	374	60	1582	0	275	0	60			
Adj No. of Lanes	1	3	0	1	3	0	1	0	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	0	4	0	5			
Cap, veh/h	127	1688	542	85	2153	0	362	0	320			
Arrive On Green	0.07	0.45	0.45	0.05	0.42	0.00	0.21	0.00	0.21			
Sat Flow, veh/h	1810	3777	1212	1810	5253	0	1740	0	1538			
Grp Volume(v), veh/h	60	1043	496	60	1582	0	275	0	60			
Grp Sat Flow(s),veh/h/ln	1810	1691	1608	1810	1695	0	1740	0	1538			
Q Serve(g_s), s	1.4	11.2	11.2	1.5	11.8	0.0	6.7	0.0	1.5			
Cycle Q Clear(g_c), s	1.4	11.2	11.2	1.5	11.8	0.0	6.7	0.0	1.5			
Prop In Lane	1.00		0.75	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	127	1511	718	85	2153	0	362	0	320			
V/C Ratio(X)	0.47	0.69	0.69	0.71	0.73	0.00	0.76	0.00	0.19			
Avail Cap(c_a), veh/h	240	1511	718	224	2191	0	807	0	714			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.2	10.0	10.0	21.3	10.9	0.0	16.9	0.0	14.8			
Incr Delay (d2), s/veh	2.7	2.0	4.1	10.3	1.8	0.0	3.3	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	5.5	5.6	1.0	5.8	0.0	3.5	0.0	0.6			
LnGrp Delay(d),s/veh	22.9	12.0	14.1	31.6	12.7	0.0	20.2	0.0	15.0			
LnGrp LOS	C	B	B	C	B		C		B			
Approach Vol, veh/h		1599			1642			335				
Approach Delay, s/veh		13.0			13.4			19.2				
Approach LOS		B			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	6.1	25.2			7.2	24.2		13.9
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	19.9			6.0	19.5		21.0
Max Q Clear Time (g_c+I1), s	3.5	13.2			3.4	13.8		8.7
Green Ext Time (p_c), s	0.0	6.7			0.0	5.4		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	2420	1865	5
Future Vol, veh/h	0	20	5	2420	1865	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	2495	1923	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	964	1928	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.2	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.95	3.1	-	-	-
Pot Cap-1 Maneuver	0	215	139	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	215	139	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.5	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	139	-	215	-	-
HCM Lane V/C Ratio	0.037	-	0.096	-	-
HCM Control Delay (s)	31.9	-	23.5	-	-
HCM Lane LOS	D	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	325	125	165	200	100	50	515	305	175	275	100
Future Volume (veh/h)	70	325	125	165	200	100	50	515	305	175	275	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	76	353	136	179	217	109	54	560	332	190	299	109
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	351	135	206	392	197	77	565	334	215	873	312
Arrive On Green	0.05	0.27	0.27	0.12	0.34	0.34	0.04	0.26	0.26	0.12	0.34	0.34
Sat Flow, veh/h	1774	1282	494	1774	1171	588	1774	2140	1268	1774	2558	914
Grp Volume(v), veh/h	76	0	489	179	0	326	54	463	429	190	205	203
Grp Sat Flow(s),veh/h/ln	1774	0	1776	1774	0	1759	1774	1770	1639	1774	1770	1702
Q Serve(g_s), s	3.4	0.0	21.9	7.9	0.0	12.1	2.4	20.9	20.9	8.4	6.9	7.1
Cycle Q Clear(g_c), s	3.4	0.0	21.9	7.9	0.0	12.1	2.4	20.9	20.9	8.4	6.9	7.1
Prop In Lane	1.00		0.28	1.00		0.33	1.00		0.77	1.00		0.54
Lane Grp Cap(c), veh/h	98	0	486	206	0	589	77	467	432	215	604	581
V/C Ratio(X)	0.78	0.00	1.01	0.87	0.00	0.55	0.70	0.99	0.99	0.88	0.34	0.35
Avail Cap(c_a), veh/h	140	0	486	206	0	589	149	467	432	215	604	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.57	0.00	0.57	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	29.1	34.7	0.0	21.7	37.7	29.4	29.4	34.6	19.6	19.7
Incr Delay (d2), s/veh	16.0	0.0	42.3	19.4	0.0	0.6	10.7	39.7	41.5	32.1	1.5	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	16.4	5.0	0.0	6.0	1.4	15.3	14.4	6.0	3.6	3.6
LnGrp Delay(d),s/veh	53.3	0.0	71.4	54.1	0.0	22.4	48.4	69.0	70.9	66.7	21.2	21.4
LnGrp LOS	D		F	D		C	D	E	E	E	C	C
Approach Vol, veh/h		565			505			946			598	
Approach Delay, s/veh		69.0			33.6			68.7			35.7	
Approach LOS		E			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	25.6	13.8	26.4	8.0	31.8	8.9	31.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	21.1	9.3	21.9	6.7	24.1	6.3	24.9
Max Q Clear Time (g_c+I1), s	10.4	22.9	9.9	23.9	4.4	9.1	5.4	14.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	7.4	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	54.4
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	815	130	25	1010	50	120	5	35	95	10	355
Future Volume (veh/h)	170	815	130	25	1010	50	120	5	35	95	10	355
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	185	886	141	27	1098	54	130	5	38	103	215	250
Adj No. of Lanes	1	3	0	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	211	1635	259	177	1822	90	191	20	153	70	147	188
Arrive On Green	0.12	0.37	0.37	0.10	0.37	0.37	0.11	0.11	0.11	0.12	0.12	0.12
Sat Flow, veh/h	1774	4428	701	1774	4966	244	1774	187	1424	594	1239	1583
Grp Volume(v), veh/h	185	677	350	27	749	403	130	0	43	318	0	250
Grp Sat Flow(s),veh/h/ln	1774	1695	1739	1774	1695	1820	1774	0	1611	1833	0	1583
Q Serve(g_s), s	6.1	9.3	9.4	0.8	10.6	10.6	4.2	0.0	1.4	7.0	0.0	7.0
Cycle Q Clear(g_c), s	6.1	9.3	9.4	0.8	10.6	10.6	4.2	0.0	1.4	7.0	0.0	7.0
Prop In Lane	1.00		0.40	1.00		0.13	1.00		0.88	0.32		1.00
Lane Grp Cap(c), veh/h	211	1252	642	177	1244	668	191	0	173	218	0	188
V/C Ratio(X)	0.88	0.54	0.54	0.15	0.60	0.60	0.68	0.00	0.25	1.46	0.00	1.33
Avail Cap(c_a), veh/h	211	1494	767	177	1379	740	902	0	820	218	0	188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.6	14.7	14.7	24.3	15.2	15.2	25.4	0.0	24.1	26.0	0.0	26.0
Incr Delay (d2), s/veh	31.7	1.3	2.6	0.4	1.7	3.2	4.2	0.0	0.7	231.3	0.0	180.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.6	4.9	0.4	5.2	5.9	2.2	0.0	0.7	17.5	0.0	12.4
LnGrp Delay(d),s/veh	57.3	16.0	17.3	24.7	16.9	18.4	29.6	0.0	24.9	257.3	0.0	206.5
LnGrp LOS	E	B	B	C	B	B	C		C	F		F
Approach Vol, veh/h		1212			1179			173			568	
Approach Delay, s/veh		22.7			17.6			28.4			235.0	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.9	26.8		10.3	11.0	26.6		11.0
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 26		30.0	7.0	24.0		7.0
Max Q Clear Time (g_c+I1), s	2.8	11.4		6.2	8.1	12.6		9.0
Green Ext Time (p_c), s	1.9	10.4		0.6	0.0	9.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	59.6
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	267.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	105	83	48	2320	1825	60
Future Vol, veh/h	105	83	48	2320	1825	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	160	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	90	52	2522	1984	65

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3381	1024	2049	0	-	0
Stage 1	2016	-	-	-	-	-
Stage 2	1365	-	-	-	-	-
Critical Hdwy	6.29	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	~ 9	200	118	-	-	-
Stage 1	~ 56	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 5	200	118	-	-	-
Mov Cap-2 Maneuver	~ 5	-	-	-	-	-
Stage 1	~ 56	-	-	-	-	-
Stage 2	~ 111	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	6299.3	1.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	118	-	5	200	-	-
HCM Lane V/C Ratio	0.442	-	22.826	0.451	-	-
HCM Control Delay (s)	57.7	$	11249.5	37	-	-
HCM Lane LOS	F	-	F	E	-	-
HCM 95th %tile Q(veh)	1.9	-	16.3	2.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	480	630	190	365	0	1225	0	350	0	0	0
Future Volume (veh/h)	5	480	630	190	365	0	1225	0	350	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1776	1845	1776	1792	1900	1810	1827	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	500	0	198	380	0	1276	0	365	0	0	0
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	7	3	7	6	6	5	0	0	0	0	0
Cap, veh/h	11	423	374	162	588	0	981	0	884	1	1	0
Arrive On Green	0.01	0.24	0.00	0.10	0.33	0.00	0.57	0.00	0.57	0.00	0.00	0.00
Sat Flow, veh/h	1810	1776	1568	1691	1792	0	1723	0	1553	1810	1900	0
Grp Volume(v), veh/h	5	500	0	198	380	0	1276	0	365	0	0	0
Grp Sat Flow(s),veh/h/ln	1810	1776	1568	1691	1792	0	1723	0	1553	1810	1900	0
Q Serve(g_s), s	0.4	33.5	0.0	13.5	25.4	0.0	80.0	0.0	18.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	33.5	0.0	13.5	25.4	0.0	80.0	0.0	18.6	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	11	423	374	162	588	0	981	0	884	1	1	0
V/C Ratio(X)	0.44	1.18	0.00	1.22	0.65	0.00	1.30	0.00	0.41	0.00	0.00	0.00
Avail Cap(c_a), veh/h	64	423	374	162	588	0	981	0	884	64	68	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	69.6	53.5	0.0	63.5	40.2	0.0	30.2	0.0	17.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	24.2	103.3	0.0	141.3	2.4	0.0	142.7	0.0	0.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	28.5	0.0	12.7	13.0	0.0	76.8	0.0	8.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	93.8	156.8	0.0	204.8	42.7	0.0	172.9	0.0	17.3	0.0	0.0	0.0
LnGrp LOS	F	F		F	D		F		B			
Approach Vol, veh/h		505			578			1641			0	
Approach Delay, s/veh		156.2			98.2			138.3			0.0	
Approach LOS		F			F			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		84.5	18.0	38.0		0.0	5.4	50.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		80.0	13.5	33.5		5.0	5.0	42.0
Max Q Clear Time (g_c+I1), s		82.0	15.5	35.5		0.0	2.4	27.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	133.1
HCM 2010 LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	285	1985	15	240	1020
Future Volume (veh/h)	15	285	1985	15	240	1020
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1863	1900	1863	1810
Adj Flow Rate, veh/h	16	306	2134	16	258	1097
Adj No. of Lanes	0	0	2	0	1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	2	2	2	5
Cap, veh/h	11	219	2163	16	272	2711
Arrive On Green	0.14	0.14	0.60	0.60	0.15	0.79
Sat Flow, veh/h	80	1539	3694	27	1774	3529
Grp Volume(v), veh/h	323	0	1047	1103	258	1097
Grp Sat Flow(s),veh/h/ln	1624	0	1770	1858	1774	1719
Q Serve(g_s), s	18.5	0.0	75.2	75.7	18.7	12.9
Cycle Q Clear(g_c), s	18.5	0.0	75.2	75.7	18.7	12.9
Prop In Lane	0.05	0.95		0.01	1.00	
Lane Grp Cap(c), veh/h	231	0	1063	1116	272	2711
V/C Ratio(X)	1.40	0.00	0.99	0.99	0.95	0.40
Avail Cap(c_a), veh/h	231	0	1063	1116	272	2711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	0.0	25.4	25.5	54.6	4.3
Incr Delay (d2), s/veh	202.9	0.0	24.2	24.1	41.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.3	0.0	43.5	46.1	12.3	6.1
LnGrp Delay(d),s/veh	258.7	0.0	49.6	49.6	95.6	4.7
LnGrp LOS	F		D	D	F	A
Approach Vol, veh/h	323		2150			1355
Approach Delay, s/veh	258.7		49.6			22.0
Approach LOS	F		D			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	24.4	82.6				107.0		23.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	19.9	78.1				102.5		18.5
Max Q Clear Time (g_c+I1), s	20.7	77.7				14.9		20.5
Green Ext Time (p_c), s	0.0	0.4				71.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.5
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	5	35	5	10	10	1785	380	20	1315	5
Future Vol, veh/h	5	5	5	35	5	10	10	1785	380	20	1315	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	1	0	5	0
Mvmt Flow	5	5	5	38	5	11	11	1940	413	22	1429	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2471	3851	717	2929	3646	1177	1435	0	0	2353	0	0
Stage 1	1476	1476	-	2168	2168	-	-	-	-	-	-	-
Stage 2	995	2375	-	761	1478	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	16	~ 4	377	~ 7	~ 5	187	479	-	-	212	-	-
Stage 1	135	192	-	49	87	-	-	-	-	-	-	-
Stage 2	266	68	-	368	192	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 4	377	-	~ 4	187	479	-	-	212	-	-
Mov Cap-2 Maneuver	-	~ 4	-	-	~ 4	-	-	-	-	-	-	-
Stage 1	132	172	-	48	85	-	-	-	-	-	-	-
Stage 2	229	66	-	315	172	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	0.4
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	479	-	-	-	377	-	187	212	-	-
HCM Lane V/C Ratio	0.023	-	-	-	0.014	-	0.058	0.103	-	-
HCM Control Delay (s)	12.7	-	-	-	14.7	-	25.4	23.9	-	-
HCM Lane LOS	B	-	-	-	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-	0.2	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	65	185	50	25	20	115	380	90	15	185	130
Future Volume (veh/h)	285	65	185	50	25	20	115	380	90	15	185	130
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1826	1810	1900	1875	1900	1827	1866	1900	1900	1810	1827
Adj Flow Rate, veh/h	320	73	208	56	28	22	129	427	101	17	208	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	5	5	5	5	4	2	2	0	5	4
Cap, veh/h	372	85	400	75	38	29	165	564	133	36	564	484
Arrive On Green	0.26	0.26	0.26	0.08	0.08	0.08	0.09	0.39	0.39	0.02	0.31	0.00
Sat Flow, veh/h	1428	326	1538	932	466	366	1740	1460	345	1810	1810	1553
Grp Volume(v), veh/h	393	0	208	106	0	0	129	0	528	17	208	0
Grp Sat Flow(s),veh/h/ln	1754	0	1538	1764	0	0	1740	0	1805	1810	1810	1553
Q Serve(g_s), s	15.2	0.0	8.2	4.2	0.0	0.0	5.2	0.0	18.1	0.7	6.4	0.0
Cycle Q Clear(g_c), s	15.2	0.0	8.2	4.2	0.0	0.0	5.2	0.0	18.1	0.7	6.4	0.0
Prop In Lane	0.81		1.00	0.53		0.21	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	456	0	400	142	0	0	165	0	698	36	564	484
V/C Ratio(X)	0.86	0.00	0.52	0.75	0.00	0.00	0.78	0.00	0.76	0.47	0.37	0.00
Avail Cap(c_a), veh/h	530	0	465	446	0	0	320	0	698	127	564	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	0.0	22.5	32.0	0.0	0.0	31.5	0.0	18.9	34.5	19.0	0.0
Incr Delay (d2), s/veh	12.2	0.0	1.0	7.6	0.0	0.0	7.9	0.0	7.5	9.1	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	0.0	3.6	2.3	0.0	0.0	2.8	0.0	10.4	0.4	3.5	0.0
LnGrp Delay(d),s/veh	37.3	0.0	23.6	39.6	0.0	0.0	39.4	0.0	26.5	43.6	20.9	0.0
LnGrp LOS	D		C	D			D		C	D	C	
Approach Vol, veh/h		601			106			657			225	
Approach Delay, s/veh		32.5			39.6			29.0			22.6	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	32.0		23.0	11.2	26.7		10.2
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	27.5		21.5	13.1	19.4		18.0
Max Q Clear Time (g_c+I1), s	2.7	20.1		17.2	7.2	8.4		6.2
Green Ext Time (p_c), s	0.0	2.8		1.3	0.1	3.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	28	527	344	1
Future Vol, veh/h	0	11	28	527	344	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	2	3	0
Mvmt Flow	0	13	33	613	400	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1079	401	401	0	-	0
Stage 1	401	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	244	653	1147	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	237	653	1147	-	-	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1147	-	653	-	-
HCM Lane V/C Ratio	0.028	-	0.02	-	-
HCM Control Delay (s)	8.2	-	10.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	160	395	25	260	95
Future Volume (veh/h)	10	160	395	25	260	95
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1854	1900	1875	1900	1810	1881
Adj Flow Rate, veh/h	11	182	449	28	295	108
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	1	1	5	1
Cap, veh/h	14	228	700	44	349	1288
Arrive On Green	0.15	0.15	0.40	0.40	0.20	0.68
Sat Flow, veh/h	90	1489	1747	109	1723	1881
Grp Volume(v), veh/h	194	0	0	477	295	108
Grp Sat Flow(s),veh/h/ln	1587	0	0	1855	1723	1881
Q Serve(g_s), s	6.5	0.0	0.0	11.5	9.1	1.1
Cycle Q Clear(g_c), s	6.5	0.0	0.0	11.5	9.1	1.1
Prop In Lane	0.06	0.94		0.06	1.00	
Lane Grp Cap(c), veh/h	243	0	0	744	349	1288
V/C Ratio(X)	0.80	0.00	0.00	0.64	0.84	0.08
Avail Cap(c_a), veh/h	515	0	0	744	419	1288
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	13.4	21.3	2.9
Incr Delay (d2), s/veh	5.9	0.0	0.0	4.2	12.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	6.7	5.6	0.6
LnGrp Delay(d),s/veh	28.6	0.0	0.0	17.6	34.0	3.1
LnGrp LOS	C			B	C	A
Approach Vol, veh/h	194		477			403
Approach Delay, s/veh	28.6		17.6			25.7
Approach LOS	C		B			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	15.7	26.8				42.5		13.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	13.5	20.0				38.0		18.0
Max Q Clear Time (g_c+I1), s	11.1	13.5				3.1		8.5
Green Ext Time (p_c), s	0.2	2.0				4.1		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	0	345	20	0	195
Future Vol, veh/h	100	0	345	20	0	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	106	0	367	21	0	207

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	585	378	0	0	388	0
Stage 1	378	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	477	673	-	-	1182	-
Stage 1	697	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	477	673	-	-	1182	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	832	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	477	-	1182	-
HCM Lane V/C Ratio	-	-	0.223	-	-	-
HCM Control Delay (s)	-	-	14.7	0	0	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.8	-	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	8	0	357	44	8	237	0
Future Vol, veh/h	0	0	0	38	0	8	0	357	44	8	237	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	3	0	0	0	2	0	0	3	0
Mvmt Flow	0	0	0	42	0	9	0	392	48	9	260	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	699	719	260	694	694	416	260	0	0	441	0	0
Stage 1	278	278	-	416	416	-	-	-	-	-	-	-
Stage 2	421	441	-	278	278	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	357	357	784	356	369	641	1316	-	-	1130	-	-
Stage 1	733	684	-	612	595	-	-	-	-	-	-	-
Stage 2	614	580	-	726	684	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	350	354	784	354	366	641	1316	-	-	1130	-	-
Mov Cap-2 Maneuver	350	354	-	354	366	-	-	-	-	-	-	-
Stage 1	733	679	-	612	595	-	-	-	-	-	-	-
Stage 2	606	580	-	720	679	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.8	0	0.3
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1316	-	-	-	384	1130	-	-
HCM Lane V/C Ratio	-	-	-	-	0.132	0.008	-	-
HCM Control Delay (s)	0	-	-	0	15.8	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	42	359	160	38	237
Future Vol, veh/h	159	42	359	160	38	237
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	181	48	408	182	43	269

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	855	499	0	0	590	0
Stage 1	499	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	331	576	-	-	995	-
Stage 1	614	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	317	576	-	-	995	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	614	-	-	-	-	-
Stage 2	682	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.3	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	439	576	995	-
HCM Lane V/C Ratio	-	-	0.412	0.083	0.043	-
HCM Control Delay (s)	-	-	18.8	11.8	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	23	492	346	3
Future Vol, veh/h	3	29	23	492	346	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	3	4	2	3	0
Mvmt Flow	3	33	26	553	389	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	994	390	392	0	-	0
Stage 1	390	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	274	656	1156	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	268	656	1156	-	-	-
Mov Cap-2 Maneuver	395	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	538	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1156	-	618	-	-
HCM Lane V/C Ratio	0.022	-	0.058	-	-
HCM Control Delay (s)	8.2	-	11.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	115	0	0	10	170	1095	0	0	840	25
Future Vol, veh/h	0	0	115	0	0	10	170	1095	0	0	840	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	7	4	3	0	33	1	0
Mvmt Flow	0	0	121	0	0	11	179	1153	0	0	884	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	884	2395	2395	1153	884	0	0	1153	0	0
Stage 1	-	-	-	1511	1511	-	-	-	-	-	-	-
Stage 2	-	-	-	884	884	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.21	7.1	6.5	6.27	4.14	-	-	4.43	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.309	3.5	4	3.363	2.236	-	-	2.497	-	-
Pot Cap-1 Maneuver	0	0	346	24	34	235	757	-	-	507	-	-
Stage 1	0	0	-	152	185	-	-	-	-	-	-	-
Stage 2	0	0	-	343	366	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	346	13	26	235	757	-	-	507	-	-
Mov Cap-2 Maneuver	-	-	-	13	26	-	-	-	-	-	-	-
Stage 1	-	-	-	116	141	-	-	-	-	-	-	-
Stage 2	-	-	-	223	366	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.9	21	1.5	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	757	-	-	346	235	507	-	-
HCM Lane V/C Ratio	0.236	-	-	0.35	0.045	-	-	-
HCM Control Delay (s)	11.2	-	-	20.9	21	0	-	-
HCM Lane LOS	B	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	1.5	0.1	0	-	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	85	280	115	40	20	260	335	250	30	195	30
Future Volume (veh/h)	75	85	280	115	40	20	260	335	250	30	195	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1667	1827	1881	1810	1900	1863	1863	1845	1900	1853	1900
Adj Flow Rate, veh/h	93	105	346	142	49	25	321	414	309	37	241	37
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	14	4	1	5	5	2	2	3	0	2	2
Cap, veh/h	447	444	405	230	144	74	362	635	526	46	473	71
Arrive On Green	0.27	0.27	0.27	0.13	0.13	0.13	0.20	0.34	0.34	0.03	0.16	0.16
Sat Flow, veh/h	1675	1667	1519	1792	1123	573	1774	1863	1543	1810	3041	459
Grp Volume(v), veh/h	93	105	346	142	0	74	321	414	309	37	138	140
Grp Sat Flow(s),veh/h/ln	1675	1667	1519	1792	0	1696	1774	1863	1543	1810	1760	1740
Q Serve(g_s), s	3.2	3.6	15.9	5.5	0.0	2.9	12.9	13.8	12.1	1.5	5.3	5.4
Cycle Q Clear(g_c), s	3.2	3.6	15.9	5.5	0.0	2.9	12.9	13.8	12.1	1.5	5.3	5.4
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	447	444	405	230	0	218	362	635	526	46	274	270
V/C Ratio(X)	0.21	0.24	0.85	0.62	0.00	0.34	0.89	0.65	0.59	0.81	0.50	0.52
Avail Cap(c_a), veh/h	640	637	580	684	0	648	375	826	684	99	492	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	21.0	25.5	30.2	0.0	29.1	28.4	20.5	19.9	35.6	28.4	28.4
Incr Delay (d2), s/veh	0.1	0.1	6.1	1.0	0.0	0.3	21.4	0.4	0.4	11.9	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.7	7.3	2.8	0.0	1.4	8.5	7.1	5.2	0.9	2.6	2.7
LnGrp Delay(d),s/veh	21.0	21.1	31.7	31.2	0.0	29.4	49.8	20.9	20.3	47.5	28.9	29.0
LnGrp LOS	C	C	C	C		C	D	C	C	D	C	C
Approach Vol, veh/h		544			216			1044			315	
Approach Delay, s/veh		27.8			30.6			29.6			31.1	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.8	30.5		23.5	19.4	16.9		13.4
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	4.0	32.5		28.0	15.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	3.5	15.8		17.9	14.9	7.4		7.5
Green Ext Time (p_c), s	0.0	3.2		1.0	0.1	3.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	15	10	80	20	275	20	550	120	405	460	10
Future Volume (veh/h)	10	15	10	80	20	275	20	550	120	405	460	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1845	1900	1881	1845	1863	1846	1900
Adj Flow Rate, veh/h	11	17	11	91	23	312	23	625	136	460	523	11
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	3	0	1	3	2	3	3
Cap, veh/h	108	152	79	287	64	717	27	731	603	502	1182	25
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.02	0.39	0.39	0.28	0.66	0.66
Sat Flow, veh/h	280	865	450	1168	365	1559	1810	1881	1552	1774	1800	38
Grp Volume(v), veh/h	39	0	0	114	0	312	23	625	136	460	0	534
Grp Sat Flow(s),veh/h/ln	1595	0	0	1533	0	1559	1810	1881	1552	1774	0	1838
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.0	10.6	1.0	23.8	4.6	19.7	0.0	11.0
Cycle Q Clear(g_c), s	1.4	0.0	0.0	4.8	0.0	10.6	1.0	23.8	4.6	19.7	0.0	11.0
Prop In Lane	0.28		0.28	0.80		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	338	0	0	351	0	717	27	731	603	502	0	1207
V/C Ratio(X)	0.12	0.00	0.00	0.32	0.00	0.44	0.84	0.86	0.23	0.92	0.00	0.44
Avail Cap(c_a), veh/h	429	0	0	441	0	812	127	804	664	589	0	1267
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	0.0	28.5	0.0	14.4	38.5	21.9	16.1	27.2	0.0	6.5
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.5	0.0	0.4	21.7	8.4	0.2	17.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	2.2	0.0	4.6	0.7	14.0	2.0	12.0	0.0	5.6
LnGrp Delay(d),s/veh	27.4	0.0	0.0	29.0	0.0	14.8	60.2	30.3	16.2	44.2	0.0	6.8
LnGrp LOS	C			C		B	E	C	B	D		A
Approach Vol, veh/h		39			426			784			994	
Approach Delay, s/veh		27.4			18.6			28.8			24.1	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.2	34.4		17.7	5.2	55.4		17.7
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	26.0	33.5		18.5	5.5	54.0		18.5
Max Q Clear Time (g_c+I1), s	21.7	25.8		3.4	3.0	13.0		12.6
Green Ext Time (p_c), s	0.5	4.6		1.8	0.0	10.9		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	35	45	50	70	50	275	600	105	30	165	530
Future Volume (veh/h)	65	35	45	50	70	50	275	600	105	30	165	530
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1839	1810	1845	1857	1900	1881	1868	1900	1845	1827	1881
Adj Flow Rate, veh/h	73	39	51	56	79	56	309	674	118	34	185	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	5	3	4	4	1	2	2	3	4	1
Cap, veh/h	136	73	180	215	124	88	379	1208	211	68	415	363
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.21	0.40	0.40	0.04	0.23	0.00
Sat Flow, veh/h	1161	620	1538	1757	1012	718	1792	3021	528	1757	1827	1599
Grp Volume(v), veh/h	112	0	51	56	0	135	309	396	396	34	185	0
Grp Sat Flow(s),veh/h/ln	1781	0	1538	1757	0	1730	1792	1775	1775	1757	1827	1599
Q Serve(g_s), s	2.6	0.0	1.3	1.3	0.0	3.3	7.3	7.6	7.7	0.8	3.9	0.0
Cycle Q Clear(g_c), s	2.6	0.0	1.3	1.3	0.0	3.3	7.3	7.6	7.7	0.8	3.9	0.0
Prop In Lane	0.65		1.00	1.00		0.41	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	209	0	180	215	0	212	379	709	710	68	415	363
V/C Ratio(X)	0.54	0.00	0.28	0.26	0.00	0.64	0.82	0.56	0.56	0.50	0.45	0.00
Avail Cap(c_a), veh/h	1023	0	884	728	0	717	787	1412	1412	257	918	804
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.5	0.0	17.9	17.7	0.0	18.5	16.7	10.3	10.3	20.9	14.8	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.3	0.2	0.0	1.2	1.7	0.4	0.4	2.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.6	0.6	0.0	1.6	3.8	3.8	3.8	0.4	2.0	0.0
LnGrp Delay(d),s/veh	19.3	0.0	18.2	17.9	0.0	19.7	18.3	10.7	10.7	23.0	15.2	0.0
LnGrp LOS	B		B	B		B	B	B	B	C	B	
Approach Vol, veh/h		163			191			1101			219	
Approach Delay, s/veh		18.9			19.2			12.8			16.4	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	21.4		8.7	12.4	13.8		9.5
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	35.3		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	2.8	9.7		4.6	9.3	5.9		5.3
Green Ext Time (p_c), s	0.0	4.8		0.4	0.3	4.2		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	232.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	295	360	620	220	70	190
Future Vol, veh/h	295	360	620	220	70	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	1	2	2	4	5
Mvmt Flow	324	396	681	242	77	209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1044	681	0	0	681	0
Stage 1	681	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.43	6.21	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	-	-	2.236	-
Pot Cap-1 Maneuver	~ 253	452	-	-	902	-
Stage 1	501	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 228	452	-	-	902	-
Mov Cap-2 Maneuver	~ 228	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	634	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 621	0	2.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	313	902	-
HCM Lane V/C Ratio	-	-	2.3	0.085	-
HCM Control Delay (s)	-	-	$ 621	9.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	55.7	0.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	13.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	380	205	70	95	70	260
Future Vol, veh/h	380	205	70	95	70	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	2	7	5	3
Mvmt Flow	442	238	81	110	81	302

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	680	0	834	561
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	-	-	4.12	-	6.45	6.23
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.327
Pot Cap-1 Maneuver	-	-	912	-	334	525
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	766	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	912	-	302	525
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	693	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	43.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	454	-	-	912	-
HCM Lane V/C Ratio	0.845	-	-	0.089	-
HCM Control Delay (s)	43.1	-	-	9.3	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	8.4	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	220	225	485	170	35	140	715	500	40	730	40
Future Volume (veh/h)	80	220	225	485	170	35	140	715	500	40	730	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	85	234	239	516	181	37	149	761	532	43	777	43
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	109	411	343	570	597	511	168	1195	805	55	978	531
Arrive On Green	0.06	0.22	0.22	0.16	0.32	0.32	0.10	0.34	0.34	0.03	0.28	0.28
Sat Flow, veh/h	1757	1881	1568	3476	1863	1594	1707	3471	1583	1810	3539	1568
Grp Volume(v), veh/h	85	234	239	516	181	37	149	761	532	43	777	43
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1594	1707	1736	1583	1810	1770	1568
Q Serve(g_s), s	3.9	9.1	11.6	12.0	6.0	1.3	7.1	15.2	20.5	1.9	16.8	1.5
Cycle Q Clear(g_c), s	3.9	9.1	11.6	12.0	6.0	1.3	7.1	15.2	20.5	1.9	16.8	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	411	343	570	597	511	168	1195	805	55	978	531
V/C Ratio(X)	0.78	0.57	0.70	0.91	0.30	0.07	0.89	0.64	0.66	0.78	0.79	0.08
Avail Cap(c_a), veh/h	213	548	457	570	622	532	168	1195	805	110	1049	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	28.7	29.7	33.8	21.1	19.5	36.7	22.7	15.0	39.7	27.6	18.5
Incr Delay (d2), s/veh	11.2	2.6	5.7	18.1	0.6	0.1	39.2	1.6	2.7	20.9	4.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	5.0	5.5	7.2	3.2	0.6	5.2	7.6	9.4	1.3	8.9	0.7
LnGrp Delay(d),s/veh	49.2	31.3	35.3	51.9	21.7	19.6	75.9	24.3	17.7	60.5	32.5	18.7
LnGrp LOS	D	C	D	D	C	B	E	C	B	E	C	B
Approach Vol, veh/h		558			734			1442			863	
Approach Delay, s/veh		35.8			42.8			27.2			33.2	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	33.8	18.0	23.5	12.6	28.2	9.6	31.9
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	27.5	13.5	24.0	8.1	24.4	10.0	27.5
Max Q Clear Time (g_c+I1), s	3.9	22.5	14.0	13.6	9.1	18.8	5.9	8.0
Green Ext Time (p_c), s	0.0	4.8	0.0	4.4	0.0	4.0	0.1	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	270	115	0	80	0	1253	280	235	1095	110
Future Volume (vph)	0	0	270	115	0	80	0	1253	280	235	1095	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.95		1.00	0.91	
Frpb, ped/bikes			0.98	1.00		1.00		1.00		1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00		1.00	1.00	
Frt			0.86	1.00		0.85		0.97		1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)			1601	1799		1455		3421		1752	5024	
Flt Permitted			1.00	0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)			1601	1799		1455		3421		1752	5024	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	281	120	0	83	0	1305	292	245	1141	115
RTOR Reduction (vph)	0	0	118	0	0	71	0	20	0	0	13	0
Lane Group Flow (vph)	0	0	163	120	0	12	0	1577	0	245	1243	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Perm		Perm		NA		Prot	NA	
Protected Phases								6		5	2	
Permitted Phases			4	8		8						
Actuated Green, G (s)			12.4	12.4		12.4		45.4		13.6	63.0	
Effective Green, g (s)			12.4	12.4		12.4		45.4		13.6	63.0	
Actuated g/C Ratio			0.15	0.15		0.15		0.53		0.16	0.74	
Clearance Time (s)			4.0	4.0		4.0		5.5		4.0	5.5	
Vehicle Extension (s)			3.0	4.0		4.0		4.0		0.5	4.0	
Lane Grp Cap (vph)			233	262		212		1829		280	3728	
v/s Ratio Prot								c0.46		c0.14	0.25	
v/s Ratio Perm			c0.10	0.07		0.01						
v/c Ratio			0.70	0.46		0.06		0.86		0.88	0.33	
Uniform Delay, d1			34.5	33.2		31.2		17.0		34.8	3.8	
Progression Factor			1.00	1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2			9.1	1.7		0.2		4.6		24.1	0.1	
Delay (s)			43.6	34.9		31.4		21.6		58.9	3.8	
Level of Service			D	C		C		C		E	A	
Approach Delay (s)		43.6			33.5			21.6			12.8	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	20	210	140	30	65	210	1120	85	100	1130	190
Future Volume (veh/h)	280	20	210	140	30	65	210	1120	85	100	1130	190
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1863	1881	1845	1863	1881
Adj Flow Rate, veh/h	292	21	219	146	31	68	219	1167	89	104	1177	198
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	1	3	2	1
Cap, veh/h	330	289	441	182	127	117	256	1647	743	131	1999	620
Arrive On Green	0.19	0.16	0.16	0.10	0.07	0.07	0.15	0.47	0.47	0.07	0.39	0.39
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	3539	1597	1757	5085	1577
Grp Volume(v), veh/h	292	21	219	146	31	68	219	1167	89	104	1177	198
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1770	1597	1757	1695	1577
Q Serve(g_s), s	14.1	0.8	6.2	7.0	1.4	3.5	10.6	22.6	2.7	5.0	15.7	7.5
Cycle Q Clear(g_c), s	14.1	0.8	6.2	7.0	1.4	3.5	10.6	22.6	2.7	5.0	15.7	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	330	289	441	182	127	117	256	1647	743	131	1999	620
V/C Ratio(X)	0.88	0.07	0.50	0.80	0.24	0.58	0.86	0.71	0.12	0.79	0.59	0.32
Avail Cap(c_a), veh/h	392	671	1024	364	614	563	303	1679	758	159	1999	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	30.8	33.1	37.7	37.7	38.6	35.8	18.3	13.0	39.1	20.6	18.1
Incr Delay (d2), s/veh	18.4	0.1	0.9	7.8	1.0	4.5	18.4	1.8	0.2	19.5	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.4	2.4	3.8	0.7	1.7	6.4	11.4	1.2	3.1	7.4	3.4
LnGrp Delay(d),s/veh	52.3	30.9	33.9	45.5	38.7	43.2	54.2	20.1	13.2	58.7	21.3	18.7
LnGrp LOS	D	C	C	D	D	D	D	C	B	E	C	B
Approach Vol, veh/h		532			245			1475			1479	
Approach Delay, s/veh		43.9			44.0			24.7			23.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	45.0	12.9	17.6	16.6	38.8	20.3	10.2
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.8	40.8	17.8	31.6	15.0	33.6	19.4	30.0
Max Q Clear Time (g_c+I1), s	7.0	24.6	9.0	8.2	12.6	17.7	16.1	5.5
Green Ext Time (p_c), s	0.0	15.4	0.2	1.3	0.1	15.4	0.3	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	28.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	0	290	1090	150	180	400	1280	240	0	1430	25
Future Volume (veh/h)	80	0	290	1090	150	180	400	1280	240	0	1430	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1864	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	83	0	302	1135	180	172	417	1333	250	0	1490	26
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	75	0	0	1187	474	384	380	2950	910	0	1650	539
Arrive On Green	0.04	0.00	0.00	0.33	0.25	0.25	0.42	1.00	1.00	0.00	0.33	0.33
Sat Flow, veh/h	1810	83		3548	1864	1509	1810	5085	1568	0	5103	1615
Grp Volume(v), veh/h	83	197.7		1135	180	172	417	1333	250	0	1490	26
Grp Sat Flow(s),veh/h/ln	1810	F		1774	1864	1509	1810	1695	1568	0	1647	1615
Q Serve(g_s), s	5.4			40.7	10.4	12.5	27.3	0.0	0.0	0.0	37.4	1.4
Cycle Q Clear(g_c), s	5.4			40.7	10.4	12.5	27.3	0.0	0.0	0.0	37.4	1.4
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	75			1187	474	384	380	2950	910	0	1650	539
V/C Ratio(X)	1.10			0.96	0.38	0.45	1.10	0.45	0.27	0.00	0.90	0.05
Avail Cap(c_a), veh/h	75			1348	559	453	380	2950	910	0	1650	539
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.75	0.75
Uniform Delay (d), s/veh	62.3			42.3	40.0	40.8	37.7	0.0	0.0	0.0	41.3	29.3
Incr Delay (d2), s/veh	135.0			13.9	0.2	0.3	75.0	0.5	0.7	0.0	6.6	0.1
Initial Q Delay(d3),s/veh	0.3			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5			22.1	5.4	5.2	21.4	0.1	0.2	0.0	18.0	0.7
LnGrp Delay(d),s/veh	197.7			56.2	40.2	41.1	112.7	0.5	0.7	0.0	47.9	29.4
LnGrp LOS	F			E	D	D	F	A	A		D	C
Approach Vol, veh/h					1487			2000			1516	
Approach Delay, s/veh					52.5			23.9			47.6	
Approach LOS					D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		81.6	48.4		32.0	49.6	10.0	38.4
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		69.5	49.4		* 27	37.5	5.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	42.7		29.3	39.4	7.4	14.5
Green Ext Time (p_c), s		15.1	0.8		0.0	0.0	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	42.2
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	560	285	85	125	0	345	0	1350	100	435	995	235
Future Volume (veh/h)	560	285	85	125	0	345	0	1350	100	435	995	235
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1827	1900	0	1900	0	1776	1900	1881	1845	1827
Adj Flow Rate, veh/h	577	294	88	129	0	356	0	1392	103	448	1026	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	4	0	0	0	0	7	0	1	3	4
Cap, veh/h	767	363	159	154	0	0	0	1528	404	1377	2433	1078
Arrive On Green	0.22	0.10	0.10	0.08	0.00	0.00	0.00	0.25	0.25	0.79	1.00	0.00
Sat Flow, veh/h	3442	3539	1553	1810	129		0	6357	1615	3476	3505	1553
Grp Volume(v), veh/h	577	294	88	129	79.2		0	1392	103	448	1026	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1553	1810	E		0	1527	1615	1738	1752	1553
Q Serve(g_s), s	20.4	10.6	7.0	9.1			0.0	28.8	5.2	4.7	0.0	0.0
Cycle Q Clear(g_c), s	20.4	10.6	7.0	9.1			0.0	28.8	5.2	4.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	767	363	159	154			0	1528	404	1377	2433	1078
V/C Ratio(X)	0.75	0.81	0.55	0.84			0.00	0.91	0.25	0.33	0.42	0.00
Avail Cap(c_a), veh/h	810	1143	502	187			0	1607	425	1377	2433	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.94	0.94	1.00	1.00	0.00
Uniform Delay (d), s/veh	47.2	57.1	55.5	58.6			0.0	47.3	23.5	8.6	0.0	0.0
Incr Delay (d2), s/veh	3.6	1.7	1.1	20.6			0.0	9.2	1.4	0.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	5.3	3.1	5.5			0.0	13.1	2.5	2.1	0.2	0.0
LnGrp Delay(d),s/veh	50.7	58.8	56.6	79.2			0.0	56.5	24.9	8.7	0.5	0.0
LnGrp LOS	D	E	E	E				E	C	A	A	
Approach Vol, veh/h		959						1495			1474	
Approach Delay, s/veh		53.7						54.4			3.0	
Approach LOS		D						D			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	57.7	38.7	15.6	17.9		96.4	33.6	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	20.4	* 34	13.4	42.0		59.2	30.6	
Max Q Clear Time (g_c+I1), s	6.7	30.8	11.1	12.6		2.0	22.4	
Green Ext Time (p_c), s	3.0	1.7	0.0	0.8		3.4	1.2	

Intersection Summary	
HCM 2010 Ctrl Delay	36.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	12	58	10	14	100	46	1180	75	0	1180	201
Future Volume (veh/h)	170	12	58	10	14	100	46	1180	75	0	1180	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1568	1776	1863	1865	1900	0	1863	1863
Adj Flow Rate, veh/h	177	12	60	10	15	104	48	1229	78	0	1229	209
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	7	2	2	2	0	2	2
Cap, veh/h	221	34	169	55	82	134	69	3954	250	0	1938	867
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.04	0.64	0.64	0.00	0.55	0.55
Sat Flow, veh/h	1774	271	1353	615	922	1509	1774	6214	393	0	3632	1583
Grp Volume(v), veh/h	177	0	72	25	0	104	48	951	356	0	1229	209
Grp Sat Flow(s),veh/h/ln	1774	0	1624	1537	0	1509	1774	1604	1795	0	1770	1583
Q Serve(g_s), s	8.7	0.0	3.7	1.4	0.0	6.1	2.4	8.1	8.1	0.0	21.7	6.2
Cycle Q Clear(g_c), s	8.7	0.0	3.7	1.4	0.0	6.1	2.4	8.1	8.1	0.0	21.7	6.2
Prop In Lane	1.00		0.83	0.40		1.00	1.00		0.22	0.00		1.00
Lane Grp Cap(c), veh/h	221	0	203	137	0	134	69	3062	1142	0	1938	867
V/C Ratio(X)	0.80	0.00	0.36	0.18	0.00	0.78	0.70	0.31	0.31	0.00	0.63	0.24
Avail Cap(c_a), veh/h	355	0	325	307	0	302	99	3062	1142	0	1938	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.80	0.80	0.80	0.00	0.89	0.89
Uniform Delay (d), s/veh	38.3	0.0	36.1	38.0	0.0	40.1	42.7	7.4	7.4	0.0	14.1	10.6
Incr Delay (d2), s/veh	6.6	0.0	1.1	0.6	0.0	9.2	9.7	0.2	0.6	0.0	1.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	1.7	0.6	0.0	2.9	1.4	3.6	4.1	0.0	10.8	2.8
LnGrp Delay(d),s/veh	44.8	0.0	37.1	38.6	0.0	49.3	52.5	7.6	8.0	0.0	15.5	11.2
LnGrp LOS	D		D	D		D	D	A	A		B	B
Approach Vol, veh/h		249			129			1355			1438	
Approach Delay, s/veh		42.6			47.2			9.3			14.9	
Approach LOS		D			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		61.8		15.7	8.0	53.8		12.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		40.5		18.0	5.0	31.0		18.0
Max Q Clear Time (g_c+I1), s		10.1		10.7	4.4	23.7		8.1
Green Ext Time (p_c), s		23.9		0.5	0.0	6.8		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	105	500	75	205	5	515	1051	175	115	845	255
Future Volume (veh/h)	245	105	500	75	205	5	515	1051	175	115	845	255
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1827	1900	1900	1900	1863	1881	1727	1863	1900
Adj Flow Rate, veh/h	253	108	515	77	211	5	531	1084	180	119	871	263
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	4	0	0	0	2	1	10	2	0
Cap, veh/h	244	612	520	117	422	359	498	2157	677	140	828	377
Arrive On Green	0.13	0.32	0.32	0.03	0.22	0.22	0.28	0.42	0.42	0.09	0.23	0.23
Sat Flow, veh/h	1810	1900	1615	3375	1900	1615	1810	5085	1597	1645	3539	1612
Grp Volume(v), veh/h	253	108	515	77	211	5	531	1084	180	119	871	263
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1688	1900	1615	1810	1695	1597	1645	1770	1612
Q Serve(g_s), s	19.9	6.0	46.9	3.3	14.4	0.4	40.7	23.1	10.8	10.5	34.6	22.1
Cycle Q Clear(g_c), s	19.9	6.0	46.9	3.3	14.4	0.4	40.7	23.1	10.8	10.5	34.6	22.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	612	520	117	422	359	498	2157	677	140	828	377
V/C Ratio(X)	1.04	0.18	0.99	0.66	0.50	0.01	1.07	0.50	0.27	0.85	1.05	0.70
Avail Cap(c_a), veh/h	244	612	520	167	450	382	498	2157	677	218	828	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.0	36.0	49.9	70.5	50.3	44.9	53.6	31.2	27.6	66.7	56.6	51.8
Incr Delay (d2), s/veh	68.1	0.2	36.9	6.1	1.1	0.0	59.0	0.2	0.3	16.7	45.7	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.5	3.2	26.2	1.7	7.7	0.2	28.4	10.9	4.8	5.4	22.1	10.4
LnGrp Delay(d),s/veh	132.1	36.2	86.8	76.6	51.4	44.9	112.6	31.4	27.9	83.3	102.3	57.6
LnGrp LOS	F	D	F	E	D	D	F	C	C	F	F	E
Approach Vol, veh/h		876			293			1795			1253	
Approach Delay, s/veh		93.6			57.9			55.0			91.1	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	68.5	9.6	52.6	45.2	40.4	24.4	37.8
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	19.6	55.7	7.3	47.6	40.7	34.6	19.9	35.0
Max Q Clear Time (g_c+I1), s	12.5	25.1	5.3	48.9	42.7	36.6	21.9	16.4
Green Ext Time (p_c), s	0.1	23.0	0.0	0.0	0.0	0.0	0.0	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	74.0
HCM 2010 LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	50	35	1570	1405	70
Future Volume (veh/h)	90	50	35	1570	1405	70
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1900	1863	1847	1900
Adj Flow Rate, veh/h	98	54	38	1707	1527	76
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	0	2	3	3
Cap, veh/h	327	155	76	2378	2594	129
Arrive On Green	0.10	0.10	0.04	0.67	0.53	0.53
Sat Flow, veh/h	3408	1615	1810	3632	5087	245
Grp Volume(v), veh/h	98	54	38	1707	1043	560
Grp Sat Flow(s),veh/h/ln	1704	1615	1810	1770	1681	1804
Q Serve(g_s), s	1.2	1.4	0.9	13.4	9.3	9.3
Cycle Q Clear(g_c), s	1.2	1.4	0.9	13.4	9.3	9.3
Prop In Lane	1.00	1.00	1.00			0.14
Lane Grp Cap(c), veh/h	327	155	76	2378	1772	951
V/C Ratio(X)	0.30	0.35	0.50	0.72	0.59	0.59
Avail Cap(c_a), veh/h	1435	680	210	2522	1772	951
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	18.6	20.6	4.6	7.1	7.1
Incr Delay (d2), s/veh	0.5	1.3	4.9	1.0	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.7	0.5	6.7	4.3	4.8
LnGrp Delay(d),s/veh	19.0	19.9	25.5	5.6	7.7	8.2
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	152			1745	1603	
Approach Delay, s/veh	19.3			6.0	7.9	
Approach LOS	B			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.7	6.4	28.9				35.2
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	5.1	21.7				31.3
Max Q Clear Time (g_c+I1), s		3.4	2.9	11.3				15.4
Green Ext Time (p_c), s		0.4	0.0	10.1				14.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	285	320	80	170	180	265	1250	75	230	1065	125
Future Volume (veh/h)	175	285	320	80	170	180	265	1250	75	230	1065	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1881	1863	1846	1900	1827	1858	1900	1863	1863	1827
Adj Flow Rate, veh/h	182	297	333	83	177	188	276	1302	78	240	1109	130
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	1	2	5	5	4	2	2	2	2	4
Cap, veh/h	214	875	391	95	317	275	351	1334	80	238	2160	647
Arrive On Green	0.12	0.25	0.25	0.05	0.18	0.18	0.10	0.39	0.39	0.13	0.42	0.42
Sat Flow, veh/h	1774	3539	1580	1774	1753	1523	3375	3383	202	1774	5085	1524
Grp Volume(v), veh/h	182	297	333	83	177	188	276	678	702	240	1109	130
Grp Sat Flow(s),veh/h/ln	1774	1770	1580	1774	1753	1523	1688	1765	1820	1774	1695	1524
Q Serve(g_s), s	11.2	7.7	22.4	5.2	10.3	12.9	8.9	42.2	42.4	15.0	17.9	6.0
Cycle Q Clear(g_c), s	11.2	7.7	22.4	5.2	10.3	12.9	8.9	42.2	42.4	15.0	17.9	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	214	875	391	95	317	275	351	696	718	238	2160	647
V/C Ratio(X)	0.85	0.34	0.85	0.87	0.56	0.68	0.79	0.97	0.98	1.01	0.51	0.20
Avail Cap(c_a), veh/h	318	983	439	95	317	275	454	696	718	238	2160	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	34.5	40.1	52.4	41.7	42.7	48.8	33.2	33.3	48.3	23.6	20.2
Incr Delay (d2), s/veh	13.3	0.8	18.7	52.9	2.8	7.5	9.9	28.3	28.5	59.9	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	3.9	11.8	3.9	5.2	6.0	4.6	26.0	26.9	11.3	8.4	2.5
LnGrp Delay(d),s/veh	61.5	35.3	58.7	105.3	44.4	50.3	58.7	61.5	61.8	108.3	23.9	20.4
LnGrp LOS	E	D	E	F	D	D	E	E	E	F	C	C
Approach Vol, veh/h		812			448			1656			1479	
Approach Delay, s/veh		50.8			58.2			61.2			37.3	
Approach LOS		D			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	49.0	10.0	33.6	15.6	52.4	17.4	26.2
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	15.0	44.0	6.0	31.0	15.0	44.0	20.0	17.0
Max Q Clear Time (g_c+I1), s	17.0	44.4	7.2	24.4	10.9	19.9	13.2	14.9
Green Ext Time (p_c), s	0.0	0.0	0.0	2.9	0.7	23.1	0.3	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	50.9
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	105	145	35	40	25	140	595	75	25	510	90
Future Volume (veh/h)	70	105	145	35	40	25	140	595	75	25	510	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1644	1810	1900	1800	1900	1792	1804	1900	1597	1863	1863
Adj Flow Rate, veh/h	77	115	159	38	44	27	154	654	82	27	560	99
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	65	64	516	68	54	542	189	713	89	43	693	576
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.11	0.45	0.45	0.03	0.37	0.37
Sat Flow, veh/h	0	189	1536	0	161	1614	1707	1572	197	1521	1863	1548
Grp Volume(v), veh/h	192	0	159	82	0	27	154	0	736	27	560	99
Grp Sat Flow(s),veh/h/ln	189	0	1536	161	0	1614	1707	0	1769	1521	1863	1548
Q Serve(g_s), s	0.0	0.0	5.9	0.0	0.0	0.9	6.8	0.0	30.0	1.4	20.8	3.3
Cycle Q Clear(g_c), s	25.9	0.0	5.9	25.9	0.0	0.9	6.8	0.0	30.0	1.4	20.8	3.3
Prop In Lane	0.40		1.00	0.46		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	129	0	516	122	0	542	189	0	803	43	693	576
V/C Ratio(X)	1.49	0.00	0.31	0.67	0.00	0.05	0.82	0.00	0.92	0.62	0.81	0.17
Avail Cap(c_a), veh/h	129	0	516	122	0	542	224	0	803	108	725	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	19.0	22.2	0.0	17.3	33.5	0.0	19.7	37.0	21.8	16.3
Incr Delay (d2), s/veh	256.0	0.0	0.4	13.8	0.0	0.0	18.4	0.0	16.1	15.9	8.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	0.0	2.5	2.2	0.0	0.4	4.2	0.0	18.1	0.8	12.2	1.5
LnGrp Delay(d),s/veh	282.5	0.0	19.4	36.1	0.0	17.3	51.9	0.0	35.8	52.9	29.9	16.6
LnGrp LOS	F		B	D		B	D		D	D	C	B
Approach Vol, veh/h		351			109			890			686	
Approach Delay, s/veh		163.3			31.4			38.6			28.9	
Approach LOS		F			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	40.4		30.4	12.6	34.1		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.5	34.6		25.9	10.1	30.0		25.9
Max Q Clear Time (g_c+I1), s	3.4	32.0		27.9	8.8	22.8		27.9
Green Ext Time (p_c), s	0.0	2.4		0.0	0.1	5.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	56.4
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	145	45	460	80	145	15	575	520	155	520	25
Future Volume (veh/h)	55	145	45	460	80	145	15	575	520	155	520	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1854	1881	1900	1845	1881	1827	1860	1900
Adj Flow Rate, veh/h	59	154	48	550	0	154	16	612	553	165	553	27
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	6	1	0	3	1	4	2	2
Cap, veh/h	199	300	90	742	0	329	27	1219	555	176	1487	72
Arrive On Green	0.11	0.11	0.11	0.21	0.00	0.21	0.01	0.35	0.35	0.10	0.43	0.43
Sat Flow, veh/h	1810	2726	820	3583	0	1587	1810	3505	1596	1740	3426	167
Grp Volume(v), veh/h	59	100	102	550	0	154	16	612	553	165	285	295
Grp Sat Flow(s),veh/h/ln	1810	1805	1742	1792	0	1587	1810	1752	1596	1740	1767	1826
Q Serve(g_s), s	2.4	4.1	4.4	11.4	0.0	6.7	0.7	10.9	27.3	7.4	8.6	8.6
Cycle Q Clear(g_c), s	2.4	4.1	4.4	11.4	0.0	6.7	0.7	10.9	27.3	7.4	8.6	8.6
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	199	199	192	742	0	329	27	1219	555	176	767	792
V/C Ratio(X)	0.30	0.50	0.53	0.74	0.00	0.47	0.59	0.50	1.00	0.94	0.37	0.37
Avail Cap(c_a), veh/h	641	639	617	1269	0	562	92	1219	555	176	767	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	33.1	33.3	29.4	0.0	27.5	38.7	20.4	25.7	35.3	15.1	15.1
Incr Delay (d2), s/veh	0.8	2.0	2.3	1.5	0.0	1.0	18.7	0.5	37.2	49.9	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.2	2.2	5.8	0.0	3.0	0.5	5.3	17.7	6.0	4.3	4.4
LnGrp Delay(d),s/veh	33.2	35.1	35.5	30.9	0.0	28.6	57.4	20.8	62.9	85.1	15.5	15.5
LnGrp LOS	C	D	D	C		C	E	C	E	F	B	B
Approach Vol, veh/h		261			704			1181			745	
Approach Delay, s/veh		34.8			30.4			41.0			30.9	
Approach LOS		C			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	32.5		13.7	5.2	39.3		20.9
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	8.0	27.5		28.0	4.0	31.5		28.0
Max Q Clear Time (g_c+I1), s	9.4	29.3		6.4	2.7	10.6		13.4
Green Ext Time (p_c), s	0.0	0.0		1.2	0.0	13.9		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	730	25	25	505	515	50	20	25	400	20	205
Future Volume (veh/h)	315	730	25	25	505	515	50	20	25	400	20	205
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1848	1900	1881	1876	1863
Adj Flow Rate, veh/h	335	777	27	27	537	0	53	21	27	441	0	218
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	320	1570	55	39	1035	450	156	63	81	738	0	324
Arrive On Green	0.18	0.45	0.45	0.02	0.29	0.00	0.09	0.09	0.09	0.21	0.00	0.21
Sat Flow, veh/h	1792	3525	122	1723	3574	1553	1810	729	938	3583	0	1574
Grp Volume(v), veh/h	335	394	410	27	537	0	53	0	48	441	0	218
Grp Sat Flow(s),veh/h/ln	1792	1788	1860	1723	1787	1553	1810	0	1667	1792	0	1574
Q Serve(g_s), s	14.5	12.7	12.7	1.3	10.2	0.0	2.2	0.0	2.2	9.1	0.0	10.4
Cycle Q Clear(g_c), s	14.5	12.7	12.7	1.3	10.2	0.0	2.2	0.0	2.2	9.1	0.0	10.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	320	796	829	39	1035	450	156	0	144	738	0	324
V/C Ratio(X)	1.05	0.49	0.49	0.70	0.52	0.00	0.34	0.00	0.33	0.60	0.00	0.67
Avail Cap(c_a), veh/h	320	796	829	125	1187	516	156	0	144	1410	0	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.4	16.0	16.0	39.5	24.1	0.0	35.0	0.0	35.0	29.2	0.0	29.7
Incr Delay (d2), s/veh	63.6	1.7	1.7	20.2	1.5	0.0	5.8	0.0	6.2	1.1	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	6.6	6.9	0.8	5.2	0.0	1.4	0.0	1.3	4.6	0.0	4.8
LnGrp Delay(d),s/veh	97.0	17.8	17.7	59.6	25.6	0.0	40.8	0.0	41.1	30.3	0.0	33.2
LnGrp LOS	F	B	B	E	C		D		D	C		C
Approach Vol, veh/h		1139			564			101			659	
Approach Delay, s/veh		41.0			27.2			41.0			31.3	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	6.3	41.2		21.8	19.0	28.5
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	5.9	35.6		32.0	14.5	27.0
Max Q Clear Time (g_c+I1), s		4.2	3.3	14.7		12.4	16.5	12.2
Green Ext Time (p_c), s		0.1	0.0	16.3		3.7	0.0	11.2

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	725	470	445	895	0	0	0	0	45	5	190
Future Volume (veh/h)	0	725	470	445	895	0	0	0	0	45	5	190
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1845	1863	0				1827	1864	1900
Adj Flow Rate, veh/h	0	763	495	468	942	0				47	5	200
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	3	2	0				4	0	4
Cap, veh/h	0	1403	626	501	2632	0				268	6	239
Arrive On Green	0.00	0.40	0.40	0.29	0.74	0.00				0.15	0.15	0.15
Sat Flow, veh/h	0	3632	1580	1757	3632	0				1740	39	1551
Grp Volume(v), veh/h	0	763	495	468	942	0				47	0	205
Grp Sat Flow(s),veh/h/ln	0	1770	1580	1757	1770	0				1740	0	1590
Q Serve(g_s), s	0.0	14.9	24.8	23.4	8.4	0.0				2.1	0.0	11.3
Cycle Q Clear(g_c), s	0.0	14.9	24.8	23.4	8.4	0.0				2.1	0.0	11.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.98
Lane Grp Cap(c), veh/h	0	1403	626	501	2632	0				268	0	245
V/C Ratio(X)	0.00	0.54	0.79	0.93	0.36	0.00				0.18	0.00	0.84
Avail Cap(c_a), veh/h	0	1403	626	554	2632	0				445	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	0.85	0.54	0.54	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.9	23.9	31.3	4.0	0.0				33.1	0.0	37.0
Incr Delay (d2), s/veh	0.0	1.3	8.4	13.5	0.2	0.0				0.1	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.6	12.2	13.2	4.1	0.0				1.0	0.0	5.2
LnGrp Delay(d),s/veh	0.0	22.2	32.3	44.9	4.2	0.0				33.2	0.0	40.2
LnGrp LOS		C	C	D	A					C		D
Approach Vol, veh/h		1258			1410						252	
Approach Delay, s/veh		26.2			17.7						38.9	
Approach LOS		C			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	31.3	40.8		18.0		72.0		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	28.4	23.8		23.0		57.8		
Max Q Clear Time (g_c+I1), s	25.4	26.8		13.3		10.4		
Green Ext Time (p_c), s	0.3	0.0		0.6		13.6		

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
19: I-80 EB Ramps & Rocklin Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	565	0	0	855	100	480	5	410	0	0	0
Future Volume (veh/h)	205	565	0	0	855	100	480	5	410	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1845	1900	1845	1828	1827			
Adj Flow Rate, veh/h	228	628	0	0	950	111	677	0	306			
Adj No. of Lanes	1	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	1	1	0	0	3	0	3	33	4			
Cap, veh/h	278	2121	0	0	1313	605	873	0	386			
Arrive On Green	0.16	0.59	0.00	0.00	0.37	0.37	0.25	0.00	0.25			
Sat Flow, veh/h	1792	3668	0	0	3597	1615	3514	0	1553			
Grp Volume(v), veh/h	228	628	0	0	950	111	677	0	306			
Grp Sat Flow(s),veh/h/ln	1792	1787	0	0	1752	1615	1757	0	1553			
Q Serve(g_s), s	6.8	4.8	0.0	0.0	12.8	2.5	9.9	0.0	10.1			
Cycle Q Clear(g_c), s	6.8	4.8	0.0	0.0	12.8	2.5	9.9	0.0	10.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	278	2121	0	0	1313	605	873	0	386			
V/C Ratio(X)	0.82	0.30	0.00	0.00	0.72	0.18	0.78	0.00	0.79			
Avail Cap(c_a), veh/h	309	2121	0	0	1313	605	952	0	421			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.86	0.86	0.00	0.00	0.91	0.91	1.00	0.00	1.00			
Uniform Delay (d), s/veh	22.5	5.5	0.0	0.0	14.8	11.5	19.2	0.0	19.4			
Incr Delay (d2), s/veh	11.4	0.3	0.0	0.0	3.2	0.6	4.1	0.0	10.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	2.4	0.0	0.0	6.6	1.2	5.3	0.0	5.4			
LnGrp Delay(d),s/veh	33.9	5.8	0.0	0.0	17.9	12.2	23.4	0.0	29.4			
LnGrp LOS	C	A			B	B	C		C			
Approach Vol, veh/h		856			1061			983				
Approach Delay, s/veh		13.3			17.3			25.3				
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		37.2			12.0	25.2		17.8
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		31.4			9.5	18.4		14.9
Max Q Clear Time (g_c+I1), s		6.8			8.8	14.8		12.1
Green Ext Time (p_c), s		9.0			0.0	2.5		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	710	205	40	710	0	245	0	55	0	0	0
Future Volume (veh/h)	60	710	205	40	710	0	245	0	55	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1867	1900	1900	1845	0	1900	0	1900			
Adj Flow Rate, veh/h	65	772	223	43	772	0	266	0	60			
Adj No. of Lanes	1	3	0	1	3	0	1	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	0	3	0	0	0	0			
Cap, veh/h	136	1763	504	68	2078	0	361	0	322			
Arrive On Green	0.08	0.45	0.45	0.04	0.41	0.00	0.20	0.00	0.20			
Sat Flow, veh/h	1810	3915	1118	1810	5202	0	1810	0	1615			
Grp Volume(v), veh/h	65	669	326	43	772	0	266	0	60			
Grp Sat Flow(s),veh/h/ln	1810	1699	1635	1810	1679	0	1810	0	1615			
Q Serve(g_s), s	1.5	5.8	5.9	1.0	4.6	0.0	6.0	0.0	1.3			
Cycle Q Clear(g_c), s	1.5	5.8	5.9	1.0	4.6	0.0	6.0	0.0	1.3			
Prop In Lane	1.00		0.68	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	136	1531	737	68	2078	0	361	0	322			
V/C Ratio(X)	0.48	0.44	0.44	0.64	0.37	0.00	0.74	0.00	0.19			
Avail Cap(c_a), veh/h	252	1531	737	235	2217	0	902	0	805			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.1	8.1	8.1	20.5	8.8	0.0	16.2	0.0	14.4			
Incr Delay (d2), s/veh	2.6	0.5	1.2	9.5	0.3	0.0	3.0	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	2.8	2.9	0.7	2.1	0.0	3.3	0.0	0.6			
LnGrp Delay(d),s/veh	21.7	8.7	9.3	30.0	9.1	0.0	19.2	0.0	14.6			
LnGrp LOS	C	A	A	C	A		B		B			
Approach Vol, veh/h		1060			815			326				
Approach Delay, s/veh		9.7			10.2			18.3				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	5.6	24.4			7.2	22.8		13.1
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	19.4			6.0	19.0		21.5
Max Q Clear Time (g_c+I1), s	3.0	7.9			3.5	6.6		8.0
Green Ext Time (p_c), s	0.0	10.5			0.0	11.2		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	10	1533	1480	0
Future Vol, veh/h	0	0	10	1533	1480	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	135	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	10	1580	1526	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	763	1526	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	301	221	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	301	221	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	221	-	-	-	-
HCM Lane V/C Ratio	0.047	-	-	-	-
HCM Control Delay (s)	22.1	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	255	90	210	185	70	40	465	405	145	300	120
Future Volume (veh/h)	140	255	90	210	185	70	40	465	405	145	300	120
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1872	1900	1863	1863	1900	1810	1863	1900	1863	1840	1900
Adj Flow Rate, veh/h	152	277	98	228	201	76	43	505	440	158	326	130
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	5	2	2	2	1	1
Cap, veh/h	186	279	99	254	324	123	63	440	384	355	1005	393
Arrive On Green	0.10	0.21	0.21	0.14	0.25	0.25	0.04	0.25	0.25	0.20	0.41	0.41
Sat Flow, veh/h	1810	1322	468	1774	1289	487	1723	1794	1563	1774	2456	961
Grp Volume(v), veh/h	152	0	375	228	0	277	43	498	447	158	230	226
Grp Sat Flow(s),veh/h/ln	1810	0	1790	1774	0	1777	1723	1770	1587	1774	1748	1670
Q Serve(g_s), s	7.4	0.0	18.8	11.4	0.0	12.4	2.2	22.1	22.1	7.0	8.1	8.3
Cycle Q Clear(g_c), s	7.4	0.0	18.8	11.4	0.0	12.4	2.2	22.1	22.1	7.0	8.1	8.3
Prop In Lane	1.00		0.26	1.00		0.27	1.00		0.98	1.00		0.58
Lane Grp Cap(c), veh/h	186	0	378	254	0	447	63	435	390	355	715	683
V/C Ratio(X)	0.82	0.00	0.99	0.90	0.00	0.62	0.68	1.15	1.15	0.45	0.32	0.33
Avail Cap(c_a), veh/h	227	0	378	254	0	447	126	435	390	355	715	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.49	0.00	0.49	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	0.0	35.4	37.9	0.0	29.9	42.8	34.0	34.0	31.6	18.1	18.2
Incr Delay (d2), s/veh	17.1	0.0	44.2	18.2	0.0	1.3	12.2	89.7	91.9	4.0	1.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	13.9	6.9	0.0	6.2	1.3	21.6	19.6	3.8	4.1	4.1
LnGrp Delay(d),s/veh	56.7	0.0	79.6	56.1	0.0	31.2	55.0	123.7	125.9	35.6	19.3	19.5
LnGrp LOS	E		E	E		C	E	F	F	D	B	B
Approach Vol, veh/h		527			505			988			614	
Approach Delay, s/veh		73.0			42.4			121.7			23.6	
Approach LOS		E			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	26.6	17.4	23.5	7.8	41.3	13.8	27.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	22.1	12.9	19.0	6.6	33.5	11.3	20.6
Max Q Clear Time (g_c+I1), s	9.0	24.1	13.4	20.8	4.2	10.3	9.4	14.4
Green Ext Time (p_c), s	0.3	0.0	0.0	0.0	0.0	10.3	0.1	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	73.9
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	685	80	25	550	10	95	5	25	25	5	85
Future Volume (veh/h)	30	685	80	25	550	10	95	5	25	25	5	85
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1867	1900	1900	1863	1900	1900	1795	1900	1900	1900	1900
Adj Flow Rate, veh/h	32	721	84	26	579	11	100	5	26	26	48	60
Adj No. of Lanes	1	3	0	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	66	1800	208	56	2081	39	162	23	117	59	109	146
Arrive On Green	0.04	0.39	0.39	0.03	0.40	0.40	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1810	4633	536	1810	5140	97	1810	252	1311	656	1211	1615
Grp Volume(v), veh/h	32	527	278	26	382	208	100	0	31	74	0	60
Grp Sat Flow(s),veh/h/ln	1810	1699	1772	1810	1696	1846	1810	0	1563	1867	0	1615
Q Serve(g_s), s	0.8	5.0	5.1	0.6	3.4	3.4	2.4	0.0	0.8	1.7	0.0	1.6
Cycle Q Clear(g_c), s	0.8	5.0	5.1	0.6	3.4	3.4	2.4	0.0	0.8	1.7	0.0	1.6
Prop In Lane	1.00		0.30	1.00		0.05	1.00		0.84	0.35		1.00
Lane Grp Cap(c), veh/h	66	1320	688	56	1373	748	162	0	140	169	0	146
V/C Ratio(X)	0.48	0.40	0.40	0.47	0.28	0.28	0.62	0.00	0.22	0.44	0.00	0.41
Avail Cap(c_a), veh/h	201	1966	1026	201	1963	1069	1208	0	1044	291	0	252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	9.9	10.0	21.4	9.0	9.0	19.7	0.0	19.0	19.4	0.0	19.3
Incr Delay (d2), s/veh	5.3	0.7	1.4	5.9	0.4	0.7	3.8	0.0	0.8	1.8	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.5	2.7	0.4	1.7	1.9	1.4	0.0	0.4	0.9	0.0	0.8
LnGrp Delay(d),s/veh	26.6	10.7	11.3	27.3	9.4	9.7	23.5	0.0	19.8	21.1	0.0	21.1
LnGrp LOS	C	B	B	C	A	A	C		B	C		C
Approach Vol, veh/h		837			616			131			134	
Approach Delay, s/veh		11.5			10.2			22.6			21.1	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.4	22.5		8.0	5.6	23.2		8.1
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 26		30.0	5.0	26.0		7.0
Max Q Clear Time (g_c+I1), s	2.6	7.1		4.4	2.8	5.4		3.7
Green Ext Time (p_c), s	1.4	10.3		0.4	0.0	8.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	53.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	98	90	52	1445	1424	56
Future Vol, veh/h	98	90	52	1445	1424	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	160	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	98	57	1571	1548	61

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2476	804	1609	0	-	0
Stage 1	1578	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Critical Hdwy	6.29	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	~ 36	280	197	-	-	-
Stage 1	107	-	-	-	-	-
Stage 2	349	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 26	280	197	-	-	-
Mov Cap-2 Maneuver	~ 26	-	-	-	-	-
Stage 1	107	-	-	-	-	-
Stage 2	248	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 898.5	1.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	197	-	26	280	-	-
HCM Lane V/C Ratio	0.287	-	4.097	0.349	-	-
HCM Control Delay (s)	30.5	-	$ 1701	24.6	-	-
HCM Lane LOS	D	-	F	C	-	-
HCM 95th %tile Q(veh)	1.1	-	13.1	1.5	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	340	620	340	145	5	1010	10	355	5	5	15
Future Volume (veh/h)	5	340	620	340	145	5	1010	10	355	5	5	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1792	1810	1863	1796	1900	1827	1795	1900	1900	1900	1900
Adj Flow Rate, veh/h	6	420	0	420	179	6	1247	12	438	6	6	19
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	17	6	5	2	6	6	4	0	0	0	0	0
Cap, veh/h	11	332	285	281	580	19	890	21	763	44	10	31
Arrive On Green	0.01	0.19	0.00	0.16	0.34	0.34	0.51	0.51	0.51	0.02	0.02	0.02
Sat Flow, veh/h	1547	1792	1538	1774	1728	58	1740	41	1491	1810	402	1273
Grp Volume(v), veh/h	6	420	0	420	0	185	1247	0	450	6	0	25
Grp Sat Flow(s),veh/h/ln	1547	1792	1538	1774	0	1786	1740	0	1532	1810	0	1675
Q Serve(g_s), s	0.6	27.5	0.0	23.5	0.0	11.4	76.0	0.0	30.2	0.5	0.0	2.2
Cycle Q Clear(g_c), s	0.6	27.5	0.0	23.5	0.0	11.4	76.0	0.0	30.2	0.5	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.97	1.00		0.76
Lane Grp Cap(c), veh/h	11	332	285	281	0	600	890	0	783	44	0	41
V/C Ratio(X)	0.53	1.27	0.00	1.50	0.00	0.31	1.40	0.00	0.57	0.14	0.00	0.61
Avail Cap(c_a), veh/h	52	332	285	281	0	600	890	0	783	61	0	56
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	73.5	60.6	0.0	62.6	0.0	36.6	36.3	0.0	25.1	71.0	0.0	71.8
Incr Delay (d2), s/veh	32.7	141.6	0.0	241.6	0.0	0.3	187.4	0.0	1.0	1.4	0.0	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	26.6	0.0	30.3	0.0	5.7	82.7	0.0	13.0	0.3	0.0	1.2
LnGrp Delay(d),s/veh	106.2	202.2	0.0	304.2	0.0	36.9	223.7	0.0	26.1	72.4	0.0	85.9
LnGrp LOS	F	F		F		D	F		C	E		F
Approach Vol, veh/h		426			605			1697			31	
Approach Delay, s/veh		200.8			222.4			171.3			83.3	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		80.5	28.0	32.0		8.1	5.6	54.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		76.0	23.5	27.5		5.0	5.0	46.0
Max Q Clear Time (g_c+I1), s		78.0	25.5	29.5		4.2	2.6	13.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	186.1
HCM 2010 LOS	F

HCM 2010 Signalized Intersection Summary
27: Sierra College Boulevard/Sierra College Blvd & English Colony Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	270	1150	10	180	955
Future Volume (veh/h)	30	270	1150	10	180	955
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1845	1900	1696	1827
Adj Flow Rate, veh/h	31	281	1198	10	188	995
Adj No. of Lanes	0	0	2	0	1	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	3	3	12	4
Cap, veh/h	36	326	1511	13	227	2207
Arrive On Green	0.22	0.22	0.42	0.42	0.14	0.64
Sat Flow, veh/h	162	1466	3655	30	1616	3563
Grp Volume(v), veh/h	313	0	589	619	188	995
Grp Sat Flow(s),veh/h/ln	1633	0	1753	1840	1616	1736
Q Serve(g_s), s	11.7	0.0	18.5	18.5	7.2	9.3
Cycle Q Clear(g_c), s	11.7	0.0	18.5	18.5	7.2	9.3
Prop In Lane	0.10	0.90		0.02	1.00	
Lane Grp Cap(c), veh/h	363	0	744	780	227	2207
V/C Ratio(X)	0.86	0.00	0.79	0.79	0.83	0.45
Avail Cap(c_a), veh/h	467	0	772	810	268	2351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	15.8	15.8	26.5	5.9
Incr Delay (d2), s/veh	12.5	0.0	5.5	5.3	16.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	10.0	10.4	4.2	4.3
LnGrp Delay(d),s/veh	36.2	0.0	21.3	21.1	43.2	6.0
LnGrp LOS	D		C	C	D	A
Approach Vol, veh/h	313		1208			1183
Approach Delay, s/veh	36.2		21.2			11.9
Approach LOS	D		C			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.4	31.4				44.8		18.6
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	27.9				42.9		18.1
Max Q Clear Time (g_c+I1), s	9.2	20.5				11.3		13.7
Green Ext Time (p_c), s	0.1	6.4				20.7		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	46.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	5	40	0	5	5	955	270	100	1240	5
Future Vol, veh/h	0	10	5	40	0	5	5	955	270	100	1240	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	4	8	0	4	50
Mvmt Flow	0	11	5	43	0	5	5	1038	293	109	1348	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2098	2910	677	2093	2767	666	1353	0	0	1332	0	0
Stage 1	1568	1568	-	1196	1196	-	-	-	-	-	-	-
Stage 2	530	1342	-	897	1571	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	30	16	400	~ 31	20	407	515	-	-	525	-	-
Stage 1	118	173	-	201	262	-	-	-	-	-	-	-
Stage 2	506	223	-	305	173	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	25	13	400	~ 8	16	407	515	-	-	525	-	-
Mov Cap-2 Maneuver	25	13	-	~ 8	16	-	-	-	-	-	-	-
Stage 1	117	137	-	199	259	-	-	-	-	-	-	-
Stage 2	494	221	-	219	137	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 384.6	$ 2580	0	1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	515	-	-	13	400	8	407	525	-	-
HCM Lane V/C Ratio	0.011	-	-	0.836	0.014	5.435	0.013	0.207	-	-
HCM Control Delay (s)	12.1	-	-	$ 569.9	14.$	2900.7	14	13.6	-	-
HCM Lane LOS	B	-	-	F	B	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0	6.8	0	0.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	65	200	60	15	10	110	285	50	15	185	105
Future Volume (veh/h)	310	65	200	60	15	10	110	285	50	15	185	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1854	1881	1900	1874	1900	1900	1855	1900	1900	1845	1827
Adj Flow Rate, veh/h	508	107	328	98	25	16	180	467	82	25	303	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Percent Heavy Veh, %	0	0	1	0	0	0	0	2	2	0	3	4
Cap, veh/h	541	114	588	121	31	20	211	530	93	44	466	392
Arrive On Green	0.37	0.37	0.37	0.10	0.10	0.10	0.12	0.34	0.34	0.02	0.25	0.00
Sat Flow, veh/h	1471	310	1599	1251	319	204	1810	1537	270	1810	1845	1553
Grp Volume(v), veh/h	615	0	328	139	0	0	180	0	549	25	303	0
Grp Sat Flow(s),veh/h/ln	1781	0	1599	1775	0	0	1810	0	1807	1810	1845	1553
Q Serve(g_s), s	36.2	0.0	17.7	8.3	0.0	0.0	10.6	0.0	31.0	1.5	15.9	0.0
Cycle Q Clear(g_c), s	36.2	0.0	17.7	8.3	0.0	0.0	10.6	0.0	31.0	1.5	15.9	0.0
Prop In Lane	0.83		1.00	0.71		0.12	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	655	0	588	172	0	0	211	0	623	44	466	392
V/C Ratio(X)	0.94	0.00	0.56	0.81	0.00	0.00	0.85	0.00	0.88	0.57	0.65	0.00
Avail Cap(c_a), veh/h	681	0	612	295	0	0	252	0	623	85	466	392
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	0.0	27.3	48.0	0.0	0.0	47.0	0.0	33.4	52.3	36.2	0.0
Incr Delay (d2), s/veh	20.6	0.0	1.0	8.6	0.0	0.0	20.9	0.0	16.4	10.9	6.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.5	0.0	8.0	4.5	0.0	0.0	6.5	0.0	18.2	0.9	9.0	0.0
LnGrp Delay(d),s/veh	53.7	0.0	28.3	56.5	0.0	0.0	67.9	0.0	49.8	63.2	43.1	0.0
LnGrp LOS	D		C	E			E		D	E	D	
Approach Vol, veh/h		943			139			729			328	
Approach Delay, s/veh		44.9			56.5			54.3			44.7	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	41.9		44.4	17.1	31.9		15.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	37.4		41.5	15.1	27.4		18.0
Max Q Clear Time (g_c+I1), s	3.5	33.0		38.2	12.6	17.9		10.3
Green Ext Time (p_c), s	0.0	2.1		1.7	0.1	3.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	48.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	23	357	379	2
Future Vol, veh/h	1	11	23	357	379	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	4	3	2	0
Mvmt Flow	1	12	26	397	421	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	870	422	423	0	-	0
Stage 1	422	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	325	636	1126	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	648	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	317	636	1126	-	-	-
Mov Cap-2 Maneuver	317	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	633	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1126	-	587	-	-
HCM Lane V/C Ratio	0.023	-	0.023	-	-
HCM Control Delay (s)	8.3	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	105	275	20	245	145
Future Volume (veh/h)	5	105	275	20	245	145
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1814	1900	1863	1845
Adj Flow Rate, veh/h	5	114	299	22	266	158
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	4	2	3
Cap, veh/h	6	146	718	53	327	1312
Arrive On Green	0.09	0.09	0.43	0.43	0.18	0.71
Sat Flow, veh/h	68	1543	1669	123	1774	1845
Grp Volume(v), veh/h	120	0	0	321	266	158
Grp Sat Flow(s),veh/h/ln	1624	0	0	1792	1774	1845
Q Serve(g_s), s	3.4	0.0	0.0	5.8	6.7	1.3
Cycle Q Clear(g_c), s	3.4	0.0	0.0	5.8	6.7	1.3
Prop In Lane	0.04	0.95		0.07	1.00	
Lane Grp Cap(c), veh/h	154	0	0	771	327	1312
V/C Ratio(X)	0.78	0.00	0.00	0.42	0.81	0.12
Avail Cap(c_a), veh/h	630	0	0	771	401	1312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	0.0	9.2	18.2	2.1
Incr Delay (d2), s/veh	8.2	0.0	0.0	1.7	10.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	3.2	4.2	0.7
LnGrp Delay(d),s/veh	28.7	0.0	0.0	10.8	28.3	2.3
LnGrp LOS	C			B	C	A
Approach Vol, veh/h	120		321			424
Approach Delay, s/veh	28.7		10.8			18.6
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.0	24.5				37.5		8.9
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	8.7	7.8				3.3		5.4
Green Ext Time (p_c), s	0.2	2.1				3.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	375	5	0	148
Future Vol, veh/h	5	0	375	5	0	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	10	0	781	10	0	308

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1094	786	0	0	792	0
Stage 1	786	-	-	-	-	-
Stage 2	308	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	239	395	-	-	838	-
Stage 1	453	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	239	395	-	-	838	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	239	-	838	-
HCM Lane V/C Ratio	-	-	0.044	-	-	-
HCM Control Delay (s)	-	-	20.7	0	0	-
HCM Lane LOS	-	-	C	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	29	0	13	2	367	35	13	140	0
Future Vol, veh/h	0	0	1	29	0	13	2	367	35	13	140	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	51	51	51	51	51	51	51	51	51	51	51	51
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	2	0
Mvmt Flow	0	0	2	57	0	25	4	720	69	25	275	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1100	1121	275	1088	1087	754	275	0	0	788	0	0
Stage 1	325	325	-	762	762	-	-	-	-	-	-	-
Stage 2	775	796	-	326	325	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	191	208	769	195	218	412	1300	-	-	840	-	-
Stage 1	692	653	-	400	416	-	-	-	-	-	-	-
Stage 2	394	402	-	691	653	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	175	201	769	190	211	412	1300	-	-	840	-	-
Mov Cap-2 Maneuver	175	201	-	190	211	-	-	-	-	-	-	-
Stage 1	690	634	-	399	415	-	-	-	-	-	-	-
Stage 2	368	401	-	669	634	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	29.5	0	0.8
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1300	-	-	769	228	840	-	-
HCM Lane V/C Ratio	0.003	-	-	0.003	0.361	0.03	-	-
HCM Control Delay (s)	7.8	-	-	9.7	29.5	9.4	-	-
HCM Lane LOS	A	-	-	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.6	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	17	387	69	7	163
Future Vol, veh/h	68	17	387	69	7	163
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	52	52	52	52	52	52
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	131	33	744	133	13	313

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1151	811	0	0	877	0
Stage 1	811	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	221	383	-	-	779	-
Stage 1	440	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	217	383	-	-	779	-
Mov Cap-2 Maneuver	338	-	-	-	-	-
Stage 1	440	-	-	-	-	-
Stage 2	713	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.8	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	338	383	779	-
HCM Lane V/C Ratio	-	-	0.387	0.085	0.017	-
HCM Control Delay (s)	-	-	22.2	15.3	9.7	-
HCM Lane LOS	-	-	C	C	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	29	440	230	1
Future Vol, veh/h	0	17	29	440	230	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	55	55	55	55
Heavy Vehicles, %	0	12	10	1	1	0
Mvmt Flow	0	31	53	800	418	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1324	419	420	0	-	0
Stage 1	419	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.29	-	-	-
Pot Cap-1 Maneuver	174	613	1097	-	-	-
Stage 1	668	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	166	613	1097	-	-	-
Mov Cap-2 Maneuver	288	-	-	-	-	-
Stage 1	668	-	-	-	-	-
Stage 2	379	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1097	-	613	-	-
HCM Lane V/C Ratio	0.048	-	0.05	-	-
HCM Control Delay (s)	8.4	-	11.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection	
Int Delay, s/veh	11.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	141	10	5	20	80	780	5	5	610	10
Future Vol, veh/h	0	0	141	10	5	20	80	780	5	5	610	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	193	14	7	27	110	1068	7	7	836	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	836	2140	2140	1072	836	0	0	1075	0	0
Stage 1	-	-	-	1291	1291	-	-	-	-	-	-	-
Stage 2	-	-	-	849	849	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	364	31	50	264	802	-	-	656	-	-
Stage 1	0	0	-	182	236	-	-	-	-	-	-	-
Stage 2	0	0	-	329	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	364	~ 13	43	264	802	-	-	656	-	-
Mov Cap-2 Maneuver	-	-	-	~ 13	43	-	-	-	-	-	-	-
Stage 1	-	-	-	157	204	-	-	-	-	-	-	-
Stage 2	-	-	-	153	376	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.5	$ 435.6	0.9	0.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	802	-	-	364	36	656	-	-
HCM Lane V/C Ratio	0.137	-	-	0.531	1.332	0.01	-	-
HCM Control Delay (s)	10.2	-	-	25.5	$ 435.6	10.5	-	-
HCM Lane LOS	B	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	3	5.1	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Cumulative Conditions – Long Term Plus Project

Project Driveway Option A

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	130	307	236	190	145	257	483	96	70	618	195
Future Volume (veh/h)	160	130	307	236	190	145	257	483	96	70	618	195
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1727	1727	1827	1840	1900	1827	1863	1863	1900	1818	1900
Adj Flow Rate, veh/h	184	149	353	271	218	167	295	555	110	80	710	224
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	10	10	4	5	5	4	2	2	0	5	5
Cap, veh/h	378	372	309	375	207	159	288	706	591	101	678	214
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.17	0.38	0.38	0.06	0.27	0.27
Sat Flow, veh/h	1757	1727	1433	1740	963	737	1740	1863	1560	1810	2555	806
Grp Volume(v), veh/h	184	149	353	271	0	385	295	555	110	80	480	454
Grp Sat Flow(s),veh/h/ln	1757	1727	1433	1740	0	1700	1740	1863	1560	1810	1727	1634
Q Serve(g_s), s	11.9	9.6	28.0	18.8	0.0	28.0	21.5	34.3	6.1	5.7	34.5	34.5
Cycle Q Clear(g_c), s	11.9	9.6	28.0	18.8	0.0	28.0	21.5	34.3	6.1	5.7	34.5	34.5
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	378	372	309	375	0	366	288	706	591	101	458	434
V/C Ratio(X)	0.49	0.40	1.14	0.72	0.00	1.05	1.03	0.79	0.19	0.79	1.05	1.05
Avail Cap(c_a), veh/h	378	372	309	375	0	366	288	706	591	111	458	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	43.8	51.0	47.4	0.0	51.0	54.3	35.7	27.0	60.6	47.8	47.8
Incr Delay (d2), s/veh	0.4	0.3	95.9	5.9	0.0	61.2	59.7	5.4	0.1	25.7	54.9	56.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	4.6	19.3	9.6	0.0	19.3	15.1	18.6	2.6	3.6	23.4	22.3
LnGrp Delay(d),s/veh	45.1	44.1	146.9	53.3	0.0	112.2	114.0	41.1	27.0	86.4	102.6	103.8
LnGrp LOS	D	D	F	D		F	F	D	C	F	F	F
Approach Vol, veh/h		686			656			960			1014	
Approach Delay, s/veh		97.3			87.8			61.9			101.9	
Approach LOS		F			F			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.3	54.7		32.0	26.0	40.0		32.0
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	8.0	48.5		28.0	21.5	34.5		28.0
Max Q Clear Time (g_c+I1), s	7.7	36.3		30.0	23.5	36.5		30.0
Green Ext Time (p_c), s	0.0	5.7		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	86.6
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	10	5	5	5	425	0	487	5	535	782	10
Future Volume (veh/h)	55	10	5	5	5	425	0	487	5	535	782	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1658	1900	1900	1900	1827	1900	1827	1827	1827	1794	1900
Adj Flow Rate, veh/h	59	11	5	5	5	457	0	524	5	575	841	11
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	4	0	4	4	4	6	6
Cap, veh/h	219	37	13	218	199	862	2	562	471	603	1236	16
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.00	0.31	0.31	0.35	0.70	0.70
Sat Flow, veh/h	699	175	62	746	952	1545	1810	1827	1533	1740	1766	23
Grp Volume(v), veh/h	75	0	0	10	0	457	0	524	5	575	0	852
Grp Sat Flow(s),veh/h/ln	937	0	0	1698	0	1545	1810	1827	1533	1740	0	1789
Q Serve(g_s), s	5.2	0.0	0.0	0.0	0.0	16.4	0.0	24.5	0.2	28.4	0.0	24.0
Cycle Q Clear(g_c), s	5.7	0.0	0.0	0.4	0.0	16.4	0.0	24.5	0.2	28.4	0.0	24.0
Prop In Lane	0.79		0.07	0.50		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	269	0	0	417	0	862	2	562	471	603	0	1252
V/C Ratio(X)	0.28	0.00	0.00	0.02	0.00	0.53	0.00	0.93	0.01	0.95	0.00	0.68
Avail Cap(c_a), veh/h	270	0	0	418	0	863	113	592	496	613	0	1252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	0.0	27.6	0.0	12.3	0.0	29.6	21.2	28.0	0.0	7.6
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.0	0.0	0.6	0.0	21.4	0.0	24.9	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	0.2	0.0	7.0	0.0	15.7	0.1	17.8	0.0	12.1
LnGrp Delay(d),s/veh	30.2	0.0	0.0	27.7	0.0	12.9	0.0	51.0	21.2	53.0	0.0	9.1
LnGrp LOS	C			C		B		D	C	D		A
Approach Vol, veh/h		75			467			529			1427	
Approach Delay, s/veh		30.2			13.2			50.7			26.8	
Approach LOS		C			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	34.5	31.1		22.4	0.0	65.6		22.4
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	31.0	28.5		18.5	5.5	54.0		18.5
Max Q Clear Time (g_c+I1), s	30.4	26.5		7.7	0.0	26.0		18.4
Green Ext Time (p_c), s	0.1	0.6		1.8	0.0	12.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	29.4
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	25	60	30	55	20	280	480	90	30	100	620
Future Volume (veh/h)	30	25	60	30	55	20	280	480	90	30	100	620
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1849	1845	1863	1795	1900	1863	1838	1900	1900	1810	1810
Adj Flow Rate, veh/h	33	27	66	33	60	22	308	527	99	33	110	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	3	2	8	8	2	4	4	0	5	5
Cap, veh/h	112	92	178	193	136	50	382	1113	208	70	365	310
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.22	0.38	0.38	0.04	0.20	0.00
Sat Flow, veh/h	990	810	1568	1774	1254	460	1774	2938	550	1810	1810	1538
Grp Volume(v), veh/h	60	0	66	33	0	82	308	312	314	33	110	0
Grp Sat Flow(s),veh/h/ln	1800	0	1568	1774	0	1714	1774	1746	1741	1810	1810	1538
Q Serve(g_s), s	1.2	0.0	1.5	0.7	0.0	1.8	6.5	5.4	5.4	0.7	2.0	0.0
Cycle Q Clear(g_c), s	1.2	0.0	1.5	0.7	0.0	1.8	6.5	5.4	5.4	0.7	2.0	0.0
Prop In Lane	0.55		1.00	1.00		0.27	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	204	0	178	193	0	186	382	661	660	70	365	310
V/C Ratio(X)	0.29	0.00	0.37	0.17	0.00	0.44	0.81	0.47	0.48	0.47	0.30	0.00
Avail Cap(c_a), veh/h	1089	0	949	823	0	795	895	1620	1616	297	1063	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.1	0.0	16.3	16.1	0.0	16.5	14.8	9.3	9.3	18.7	13.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.5	0.2	0.0	0.6	1.5	0.3	0.3	1.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.7	0.3	0.0	0.9	3.3	2.6	2.6	0.4	1.0	0.0
LnGrp Delay(d),s/veh	16.4	0.0	16.7	16.2	0.0	17.2	16.3	9.6	9.6	20.5	13.7	0.0
LnGrp LOS	B		B	B		B	B	A	A	C	B	
Approach Vol, veh/h		126			115			934			143	
Approach Delay, s/veh		16.6			16.9			11.8			15.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	18.7		8.0	11.5	11.7		8.4
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	36.8		24.0	20.0	23.3		18.4
Max Q Clear Time (g_c+I1), s	2.7	7.4		3.5	8.5	4.0		3.8
Green Ext Time (p_c), s	0.0	3.5		0.2	0.3	3.2		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	80.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	205	310	540	120	35	155
Future Vol, veh/h	205	310	540	120	35	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	4	3	6	10	2
Mvmt Flow	225	341	593	132	38	170

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	840	593	0	0	593	0
Stage 1	593	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.42	6.24	-	-	4.2	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.336	-	-	2.29	-
Pot Cap-1 Maneuver	335	502	-	-	945	-
Stage 1	552	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	320	502	-	-	945	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	213.9	0	1.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	409	945	-
HCM Lane V/C Ratio	-	-	1.384	0.041	-
HCM Control Delay (s)	-	-	213.9	9	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	27.4	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	86	16	110	386	46	35
Future Vol, veh/h	86	16	110	386	46	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	9	7	3	18	6
Mvmt Flow	98	18	125	439	52	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	116	0	796	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	689	-
Critical Hdwy	-	-	4.17	-	6.58	6.26
Critical Hdwy Stg 1	-	-	-	-	5.58	-
Critical Hdwy Stg 2	-	-	-	-	5.58	-
Follow-up Hdwy	-	-	2.263	-	3.662	3.354
Pot Cap-1 Maneuver	-	-	1442	-	335	936
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	470	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1442	-	296	936
Mov Cap-2 Maneuver	-	-	-	-	296	-
Stage 1	-	-	-	-	879	-
Stage 2	-	-	-	-	416	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	420	-	-	1442	-
HCM Lane V/C Ratio	0.219	-	-	0.087	-
HCM Control Delay (s)	16	-	-	7.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	110	82	467	355	65	227	667	212	60	1497	250
Future Volume (veh/h)	85	110	82	467	355	65	227	667	212	60	1497	250
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1792	1743	1863	1743	1810	1727	1792	1810	1827	1863	1881
Adj Flow Rate, veh/h	90	117	87	497	378	69	241	710	226	64	1593	266
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	6	6	9	2	9	5	10	6	5	4	2	1
Cap, veh/h	104	279	231	473	405	353	226	1792	1021	81	1541	794
Arrive On Green	0.06	0.16	0.16	0.14	0.23	0.23	0.14	0.53	0.53	0.05	0.44	0.44
Sat Flow, veh/h	1707	1792	1482	3442	1743	1518	1645	3406	1538	1740	3539	1599
Grp Volume(v), veh/h	90	117	87	497	378	69	241	710	226	64	1593	266
Grp Sat Flow(s),veh/h/ln	1707	1792	1482	1721	1743	1518	1645	1703	1538	1740	1770	1599
Q Serve(g_s), s	7.8	8.8	7.9	20.5	31.7	5.5	20.5	18.6	8.6	5.4	65.0	15.0
Cycle Q Clear(g_c), s	7.8	8.8	7.9	20.5	31.7	5.5	20.5	18.6	8.6	5.4	65.0	15.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	104	279	231	473	405	353	226	1792	1021	81	1541	794
V/C Ratio(X)	0.86	0.42	0.38	1.05	0.93	0.20	1.07	0.40	0.22	0.79	1.03	0.34
Avail Cap(c_a), veh/h	104	288	238	473	413	360	226	1792	1021	141	1541	794
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.5	56.9	56.5	64.4	56.2	46.1	64.4	21.2	9.9	70.4	42.1	22.7
Incr Delay (d2), s/veh	48.5	2.1	2.2	55.6	28.9	0.6	78.6	0.3	0.2	15.5	32.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	4.5	3.4	13.4	18.6	2.3	14.2	8.9	3.7	3.0	38.5	6.7
LnGrp Delay(d),s/veh	118.0	59.0	58.7	119.9	85.1	46.7	143.0	21.5	10.1	86.0	74.2	23.2
LnGrp LOS	F	E	E	F	F	D	F	C	B	F	F	C
Approach Vol, veh/h		294			944			1177			1923	
Approach Delay, s/veh		77.0			100.6			44.2			67.5	
Approach LOS		E			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	84.1	25.0	28.8	25.0	70.5	13.6	40.2
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.1	73.4	20.5	24.0	20.5	65.0	9.1	35.4
Max Q Clear Time (g_c+I1), s	7.4	20.6	22.5	10.8	22.5	67.0	9.8	33.7
Green Ext Time (p_c), s	0.0	49.3	0.0	5.2	0.0	0.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	69.0
HCM 2010 LOS	E

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	65	295	0	222	0	859	25	80	1881	55
Future Volume (vph)	0	0	65	295	0	222	0	859	25	80	1881	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1432	1770		1495		4893	1583	1736	5066	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1432	1770		1495		4893	1583	1736	5066	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	69	314	0	236	0	914	27	85	2001	59
RTOR Reduction (vph)	0	0	67	0	0	159	0	0	10	0	5	0
Lane Group Flow (vph)	0	0	2	314	0	77	0	914	17	85	2055	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			1.7	13.1		19.3		23.2	36.3	3.3	30.5	
Effective Green, g (s)			1.7	13.1		19.3		23.2	36.3	3.3	30.5	
Actuated g/C Ratio			0.03	0.22		0.33		0.39	0.61	0.06	0.51	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			41	391		486		1914	969	96	2605	
v/s Ratio Prot				c0.18				0.19	0.00	0.05	c0.41	
v/s Ratio Perm			0.00			c0.05			0.01			
v/c Ratio			0.05	0.80		0.16		0.48	0.02	0.89	0.79	
Uniform Delay, d1			28.0	21.9		14.2		13.5	4.5	27.8	11.8	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.5	11.3		0.2		0.3	0.0	55.0	1.8	
Delay (s)			28.5	33.2		14.4		13.8	4.5	82.8	13.5	
Level of Service			C	C		B		B	A	F	B	
Approach Delay (s)		28.5			25.1			13.5			16.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	10	125	160	30	25	350	1012	90	80	1966	148
Future Volume (veh/h)	73	10	125	160	30	25	350	1012	90	80	1966	148
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1776	1881	1743	1845	1863
Adj Flow Rate, veh/h	76	10	130	167	31	26	365	1054	94	83	2048	154
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	1	9	3	2
Cap, veh/h	97	130	183	197	234	205	401	2011	952	105	2138	663
Arrive On Green	0.06	0.07	0.07	0.12	0.14	0.14	0.23	0.60	0.60	0.06	0.42	0.42
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	3374	1598	1660	5036	1562
Grp Volume(v), veh/h	76	10	130	167	31	26	365	1054	94	83	2048	154
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1687	1598	1660	1679	1562
Q Serve(g_s), s	5.3	0.6	6.0	11.5	1.8	1.8	24.1	21.3	2.9	5.7	45.8	7.3
Cycle Q Clear(g_c), s	5.3	0.6	6.0	11.5	1.8	1.8	24.1	21.3	2.9	5.7	45.8	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	130	183	197	234	205	401	2011	952	105	2138	663
V/C Ratio(X)	0.79	0.08	0.71	0.85	0.13	0.13	0.91	0.52	0.10	0.79	0.96	0.23
Avail Cap(c_a), veh/h	425	451	634	425	447	390	662	2011	952	286	2171	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	49.9	52.4	50.0	44.1	44.1	43.2	13.8	10.1	53.6	32.4	21.3
Incr Delay (d2), s/veh	13.1	0.2	5.0	9.7	0.3	0.3	10.8	0.5	0.1	12.6	11.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.3	2.2	5.8	0.9	0.7	12.6	9.9	1.3	3.0	23.3	3.2
LnGrp Delay(d),s/veh	67.0	50.2	57.4	59.8	44.4	44.4	54.0	14.2	10.1	66.2	43.7	21.7
LnGrp LOS	E	D	E	E	D	D	D	B	B	E	D	C
Approach Vol, veh/h		216			224			1513			2285	
Approach Delay, s/veh		60.5			55.8			23.6			43.0	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	74.1	17.9	12.7	31.2	54.2	10.8	19.7
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	7.7	23.3	13.5	8.0	26.1	47.8	7.3	3.8
Green Ext Time (p_c), s	0.1	26.4	0.4	0.8	1.1	1.5	0.2	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	65	735	55	402	80	1045	150	0	2201	50
Future Volume (veh/h)	5	0	65	735	55	402	80	1045	150	0	2201	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1759	1845	1796	1776	1827	1792	1681	0	1696	1900
Adj Flow Rate, veh/h	5	0	71	799	0	477	87	1136	163	0	2392	54
Adj No. of Lanes	1	0	1	2	0	2	1	3	1	0	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	8	3	2	7	4	6	13	0	12	0
Cap, veh/h	11	0	0	847	0	606	99	3341	976	0	2750	959
Arrive On Green	0.01	0.00	0.00	0.24	0.00	0.20	0.02	0.23	0.23	0.00	0.59	0.59
Sat Flow, veh/h	1810	5		3514	0	3019	1740	4893	1429	0	4784	1615
Grp Volume(v), veh/h	5	81.9		799	0	477	87	1136	163	0	2392	54
Grp Sat Flow(s),veh/h/ln	1810	F		1757	0	1509	1740	1631	1429	0	1544	1615
Q Serve(g_s), s	0.4			32.6	0.0	21.9	7.3	28.4	13.4	0.0	63.4	2.1
Cycle Q Clear(g_c), s	0.4			32.6	0.0	21.9	7.3	28.4	13.4	0.0	63.4	2.1
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	11			847	0	606	99	3341	976	0	2750	959
V/C Ratio(X)	0.44			0.94	0.00	0.79	0.88	0.34	0.17	0.00	0.87	0.06
Avail Cap(c_a), veh/h	62			1179	0	806	99	3341	976	0	2750	959
HCM Platoon Ratio	1.00			1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.34	0.34
Uniform Delay (d), s/veh	72.3			54.4	0.0	55.4	71.1	28.9	23.1	0.0	24.9	12.5
Incr Delay (d2), s/veh	9.6			10.2	0.0	2.7	52.5	0.3	0.4	0.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2			17.1	0.0	9.4	5.0	13.0	5.4	0.0	27.2	0.9
LnGrp Delay(d),s/veh	81.9			64.6	0.0	58.1	123.7	29.2	23.5	0.0	26.3	12.5
LnGrp LOS	F			E		E	F	C	C		C	B
Approach Vol, veh/h					1276			1386			2446	
Approach Delay, s/veh					62.2			34.5			26.0	
Approach LOS					E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		105.9	40.1		13.0	92.9	5.5	34.6
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		85.9	49.0		* 8.3	72.9	5.0	39.0
Max Q Clear Time (g_c+I1), s		30.4	34.6		9.3	65.4	2.4	23.9
Green Ext Time (p_c), s		25.0	0.6		0.0	6.4	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	551	115	425	15	0	30	0	1175	35	220	1990	231
Future Volume (veh/h)	551	115	425	15	0	30	0	1175	35	220	1990	231
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1776	1845	1776	1845	0	1863	0	1667	1792	1863	1863	1743
Adj Flow Rate, veh/h	599	125	462	16	0	33	0	1277	38	239	2163	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	3	7	3	0	2	0	14	6	2	2	9
Cap, veh/h	1106	1008	434	32	0	0	0	2723	724	284	2084	873
Arrive On Green	0.34	0.29	0.29	0.02	0.00	0.00	0.00	0.47	0.47	0.11	0.78	0.00
Sat Flow, veh/h	3281	3505	1509	1757	16		0	5967	1524	3442	3539	1482
Grp Volume(v), veh/h	599	125	462	16	75.6		0	1277	38	239	2163	0
Grp Sat Flow(s),veh/h/ln	1640	1752	1509	1757	E		0	1433	1524	1721	1770	1482
Q Serve(g_s), s	21.6	3.8	42.0	1.3			0.0	22.0	1.6	9.9	86.0	0.0
Cycle Q Clear(g_c), s	21.6	3.8	42.0	1.3			0.0	22.0	1.6	9.9	86.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1106	1008	434	32			0	2723	724	284	2084	873
V/C Ratio(X)	0.54	0.12	1.06	0.51			0.00	0.47	0.05	0.84	1.04	0.00
Avail Cap(c_a), veh/h	1106	1008	434	84			0	2723	724	389	2084	873
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.2	38.4	52.0	71.0			0.0	25.9	14.0	64.1	15.8	0.0
Incr Delay (d2), s/veh	0.4	0.0	61.2	4.6			0.0	0.6	0.1	8.8	30.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	1.9	24.9	0.7			0.0	8.8	0.7	5.1	49.5	0.0
LnGrp Delay(d),s/veh	39.7	38.4	113.2	75.7			0.0	26.4	14.2	72.9	46.1	0.0
LnGrp LOS	D	D	F	E				C	B	E	F	
Approach Vol, veh/h		1186						1315			2402	
Approach Delay, s/veh		68.2						26.1			48.8	
Approach LOS		E						C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	16.6	75.5	7.2	46.6		92.2	53.8	
Change Period (Y+Rc), s	4.6	6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	16.5	60.5	7.0	42.0		81.6	33.7	
Max Q Clear Time (g_c+I1), s	11.9	24.0	3.3	44.0		88.0	23.6	
Green Ext Time (p_c), s	0.1	20.0	0.0	0.0		0.0	1.4	

Intersection Summary	
HCM 2010 Ctrl Delay	47.5
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	5	65	15	5	70	60	1010	20	0	2245	185
Future Volume (veh/h)	130	5	65	15	5	70	60	1010	20	0	2245	185
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1891	1532	1863	1776	1900	0	1810	1863
Adj Flow Rate, veh/h	141	5	71	16	5	76	65	1098	22	0	2440	201
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	24	2	7	7	0	5	2
Cap, veh/h	166	10	140	98	31	92	65	4634	93	0	2335	1075
Arrive On Green	0.09	0.09	0.09	0.07	0.07	0.07	0.04	0.75	0.75	0.00	0.68	0.68
Sat Flow, veh/h	1774	105	1494	1388	434	1302	1774	6213	124	0	3529	1583
Grp Volume(v), veh/h	141	0	76	21	0	76	65	809	311	0	2440	201
Grp Sat Flow(s),veh/h/ln	1774	0	1599	1822	0	1302	1774	1528	1754	0	1719	1583
Q Serve(g_s), s	11.7	0.0	6.8	1.6	0.0	8.6	5.5	8.2	8.2	0.0	101.9	7.0
Cycle Q Clear(g_c), s	11.7	0.0	6.8	1.6	0.0	8.6	5.5	8.2	8.2	0.0	101.9	7.0
Prop In Lane	1.00		0.93	0.76		1.00	1.00		0.07	0.00		1.00
Lane Grp Cap(c), veh/h	166	0	150	129	0	92	65	3418	1308	0	2335	1075
V/C Ratio(X)	0.85	0.00	0.51	0.16	0.00	0.83	1.00	0.24	0.24	0.00	1.05	0.19
Avail Cap(c_a), veh/h	213	0	192	219	0	156	65	3418	1308	0	2335	1075
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.88	0.88	0.88	0.00	0.15	0.15
Uniform Delay (d), s/veh	66.9	0.0	64.7	65.5	0.0	68.8	72.2	5.9	5.9	0.0	24.1	8.8
Incr Delay (d2), s/veh	21.8	0.0	2.6	0.6	0.0	16.6	104.4	0.1	0.4	0.0	22.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	3.1	0.8	0.0	3.5	4.6	3.5	4.1	0.0	55.4	3.1
LnGrp Delay(d),s/veh	88.7	0.0	67.3	66.1	0.0	85.4	176.6	6.0	6.3	0.0	46.8	8.9
LnGrp LOS	F		E	E		F	F	A	A		F	A
Approach Vol, veh/h		217			97			1185			2641	
Approach Delay, s/veh		81.2			81.2			15.4			43.9	
Approach LOS		F			F			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		116.4		18.5	10.0	106.4		15.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		100.5		18.0	5.5	90.5		18.0
Max Q Clear Time (g_c+I1), s		10.2		13.7	7.5	103.9		10.6
Green Ext Time (p_c), s		81.1		0.3	0.0	0.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	38.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	35	240	105	120	10	290	955	75	60	2040	225
Future Volume (veh/h)	125	35	240	105	120	10	290	955	75	60	2040	225
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1267	1900	1900	1597	1900	1520	1900	1792	1743	1387	1827	1429
Adj Flow Rate, veh/h	136	38	261	114	130	11	315	1038	82	65	2217	245
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	50	0	0	19	0	25	0	6	9	37	4	33
Cap, veh/h	102	352	299	156	292	198	233	2729	826	77	1692	591
Arrive On Green	0.08	0.19	0.19	0.05	0.15	0.15	0.13	0.56	0.56	0.06	0.49	0.49
Sat Flow, veh/h	1206	1900	1615	2950	1900	1292	1810	4893	1480	1321	3471	1213
Grp Volume(v), veh/h	136	38	261	114	130	11	315	1038	82	65	2217	245
Grp Sat Flow(s),veh/h/ln	1206	1900	1615	1475	1900	1292	1810	1631	1480	1321	1736	1213
Q Serve(g_s), s	11.5	2.3	21.3	5.2	8.4	1.0	17.5	16.2	3.5	6.6	66.2	17.6
Cycle Q Clear(g_c), s	11.5	2.3	21.3	5.2	8.4	1.0	17.5	16.2	3.5	6.6	66.2	17.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	352	299	156	292	198	233	2729	826	77	1692	591
V/C Ratio(X)	1.33	0.11	0.87	0.73	0.45	0.06	1.35	0.38	0.10	0.84	1.31	0.41
Avail Cap(c_a), veh/h	102	495	421	241	490	333	233	2729	826	155	1692	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.2	46.0	53.8	63.4	52.3	49.1	59.2	16.9	14.1	63.3	34.8	22.4
Incr Delay (d2), s/veh	201.7	0.2	14.4	6.5	1.3	0.1	183.7	0.1	0.1	20.8	144.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	1.2	10.7	2.2	4.5	0.4	20.6	7.3	1.5	2.9	65.3	6.0
LnGrp Delay(d),s/veh	263.8	46.2	68.2	69.8	53.5	49.2	242.8	17.0	14.1	84.1	179.0	22.9
LnGrp LOS	F	D	E	E	D	D	F	B	B	F	F	C
Approach Vol, veh/h		435			255			1435			2527	
Approach Delay, s/veh		127.4			60.6			66.4			161.4	
Approach LOS		F			E			E			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	81.6	11.7	30.2	22.0	72.0	16.0	25.8
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	15.9	67.8	11.1	35.4	17.5	66.2	11.5	35.0
Max Q Clear Time (g_c+I1), s	8.6	18.2	7.2	23.3	19.5	68.2	13.5	10.4
Green Ext Time (p_c), s	0.1	47.1	0.1	1.8	0.0	0.0	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	123.4
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	15	175	1220	1765	785
Future Volume (veh/h)	40	15	175	1220	1765	785
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1900	1900	1810	1836	1900
Adj Flow Rate, veh/h	53	20	230	1605	2322	1033
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	5	0	0	5	5	5
Cap, veh/h	116	56	254	3058	2542	989
Arrive On Green	0.03	0.03	0.14	0.89	0.72	0.72
Sat Flow, veh/h	3343	1615	1810	3529	3717	1382
Grp Volume(v), veh/h	53	20	230	1605	2165	1190
Grp Sat Flow(s),veh/h/ln	1672	1615	1810	1719	1671	1591
Q Serve(g_s), s	2.1	1.6	16.8	13.0	70.4	96.3
Cycle Q Clear(g_c), s	2.1	1.6	16.8	13.0	70.4	96.3
Prop In Lane	1.00	1.00	1.00			0.87
Lane Grp Cap(c), veh/h	116	56	254	3058	2392	1139
V/C Ratio(X)	0.46	0.36	0.91	0.52	0.91	1.04
Avail Cap(c_a), veh/h	484	234	262	3074	2392	1139
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.7	63.5	57.0	1.5	15.4	19.1
Incr Delay (d2), s/veh	2.8	3.8	31.5	0.2	5.5	39.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.8	10.7	6.1	33.7	54.1
LnGrp Delay(d),s/veh	66.5	67.3	88.5	1.7	20.9	58.2
LnGrp LOS	E	E	F	A	C	F
Approach Vol, veh/h	73			1835	3355	
Approach Delay, s/veh	66.7			12.6	34.1	
Approach LOS	E			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.2	23.4	102.0				125.4
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		19.5	19.5	96.3				120.3
Max Q Clear Time (g_c+I1), s		4.1	18.8	98.3				15.0
Green Ext Time (p_c), s		0.1	0.0	0.0				104.5

Intersection Summary	
HCM 2010 Ctrl Delay	27.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	580	225	185	387	291	488	997	110	151	1172	307
Future Volume (veh/h)	107	580	225	185	387	291	488	997	110	151	1172	307
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1863	1845	1900	1863	1900	1881	1779	1900	1696	1827	1827
Adj Flow Rate, veh/h	116	630	245	201	421	316	530	1084	120	164	1274	334
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	2	3	0	2	2	1	7	7	12	4	4
Cap, veh/h	142	1000	438	158	549	408	438	1071	118	157	1596	487
Arrive On Green	0.08	0.28	0.28	0.09	0.29	0.29	0.13	0.35	0.35	0.10	0.32	0.32
Sat Flow, veh/h	1707	3539	1551	1810	1916	1426	3476	3067	339	1616	4988	1520
Grp Volume(v), veh/h	116	630	245	201	389	348	530	597	607	164	1274	334
Grp Sat Flow(s),veh/h/ln	1707	1770	1551	1810	1770	1572	1738	1690	1716	1616	1663	1520
Q Serve(g_s), s	6.9	16.0	13.9	9.0	20.7	21.0	13.0	36.0	36.0	10.0	24.1	19.7
Cycle Q Clear(g_c), s	6.9	16.0	13.9	9.0	20.7	21.0	13.0	36.0	36.0	10.0	24.1	19.7
Prop In Lane	1.00		1.00	1.00		0.91	1.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	142	1000	438	158	507	450	438	590	599	157	1596	487
V/C Ratio(X)	0.82	0.63	0.56	1.27	0.77	0.77	1.21	1.01	1.01	1.05	0.80	0.69
Avail Cap(c_a), veh/h	166	1064	466	158	515	457	438	590	599	157	1596	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	32.3	31.5	47.1	33.7	33.7	45.1	33.6	33.6	46.6	32.0	30.6
Incr Delay (d2), s/veh	23.2	2.5	4.1	162.9	7.2	8.5	114.0	40.0	40.2	84.9	3.1	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	8.1	6.4	11.6	11.2	10.2	13.1	23.3	23.7	8.1	11.4	8.9
LnGrp Delay(d),s/veh	69.6	34.8	35.6	209.9	40.9	42.2	159.0	73.5	73.8	131.5	35.1	35.0
LnGrp LOS	E	C	D	F	D	D	F	F	F	F	D	D
Approach Vol, veh/h		991			938			1734			1772	
Approach Delay, s/veh		39.1			77.6			99.8			44.0	
Approach LOS		D			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	41.0	13.0	35.1	17.0	38.0	12.6	35.5
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	10.0	36.0	9.0	31.0	13.0	33.0	10.0	30.0
Max Q Clear Time (g_c+I1), s	12.0	38.0	11.0	18.0	15.0	26.1	8.9	23.0
Green Ext Time (p_c), s	0.0	0.0	0.0	10.8	0.0	6.8	0.0	6.2

Intersection Summary	
HCM 2010 Ctrl Delay	66.7
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	40	125	90	310	60	270	292	165	60	647	90
Future Volume (veh/h)	20	40	125	90	310	60	270	292	165	60	647	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1477	1484	1900	1722	1792	1712	1696	1900	1387	1776	1727
Adj Flow Rate, veh/h	22	44	137	99	341	66	297	321	181	66	711	99
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	33	33	28	9	9	6	11	7	7	37	7	10
Cap, veh/h	44	54	350	40	37	422	298	546	308	78	732	592
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.18	0.54	0.54	0.06	0.41	0.41
Sat Flow, veh/h	0	193	1259	0	132	1522	1630	1019	575	1321	1776	1436
Grp Volume(v), veh/h	66	0	137	440	0	66	297	0	502	66	711	99
Grp Sat Flow(s),veh/h/ln	193	0	1259	132	0	1522	1630	0	1594	1321	1776	1436
Q Serve(g_s), s	0.0	0.0	9.7	0.0	0.0	3.6	20.0	0.0	23.5	5.4	43.1	4.8
Cycle Q Clear(g_c), s	30.5	0.0	9.7	30.5	0.0	3.6	20.0	0.0	23.5	5.4	43.1	4.8
Prop In Lane	0.33		1.00	0.22		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	97	0	350	77	0	422	298	0	854	78	732	592
V/C Ratio(X)	0.68	0.00	0.39	5.73	0.00	0.16	1.00	0.00	0.59	0.85	0.97	0.17
Avail Cap(c_a), veh/h	97	0	350	77	0	422	298	0	854	151	734	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	0.0	32.2	40.9	0.0	30.0	44.9	0.0	17.3	51.2	31.7	20.4
Incr Delay (d2), s/veh	18.0	0.0	0.8	2154.6	0.0	0.2	51.0	0.0	2.0	23.7	26.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	3.4	48.3	0.0	1.5	13.1	0.0	10.7	2.5	26.5	2.0
LnGrp Delay(d),s/veh	51.2	0.0	33.0	2195.5	0.0	30.2	95.8	0.0	19.3	74.9	58.3	20.8
LnGrp LOS	D		C	F		C	F		B	E	E	C
Approach Vol, veh/h		203			506			799			876	
Approach Delay, s/veh		38.9			1913.1			47.7			55.3	
Approach LOS		D			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.6	64.3		35.0	24.2	50.7		35.0
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	12.6	52.9		30.5	20.1	45.4		30.5
Max Q Clear Time (g_c+I1), s	7.4	25.5		32.5	22.0	45.1		32.5
Green Ext Time (p_c), s	0.1	19.5		0.0	0.0	0.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	445.7
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	90	60	732	205	195	55	699	812	250	649	24
Future Volume (veh/h)	29	90	60	732	205	195	55	699	812	250	649	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1881	1900	1845	1837	1863	1863	1792	1863	1827	1780	1900
Adj Flow Rate, veh/h	32	100	67	520	637	217	61	777	902	278	721	27
Adj No. of Lanes	1	2	0	1	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	1	1	3	4	2	2	6	2	4	7	7
Cap, veh/h	130	178	110	521	545	467	78	1202	558	222	1449	54
Arrive On Green	0.08	0.08	0.08	0.30	0.30	0.30	0.04	0.35	0.35	0.13	0.44	0.44
Sat Flow, veh/h	1547	2110	1301	1757	1837	1575	1774	3406	1581	1740	3321	124
Grp Volume(v), veh/h	32	83	84	520	637	217	61	777	902	278	367	381
Grp Sat Flow(s),veh/h/ln	1547	1787	1624	1757	1837	1575	1774	1703	1581	1740	1691	1755
Q Serve(g_s), s	2.6	6.0	6.6	39.4	39.5	15.0	4.5	25.5	47.0	17.0	20.8	20.8
Cycle Q Clear(g_c), s	2.6	6.0	6.6	39.4	39.5	15.0	4.5	25.5	47.0	17.0	20.8	20.8
Prop In Lane	1.00		0.80	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	130	150	137	521	545	467	78	1202	558	222	738	765
V/C Ratio(X)	0.25	0.55	0.61	1.00	1.17	0.46	0.78	0.65	1.62	1.25	0.50	0.50
Avail Cap(c_a), veh/h	325	376	341	521	545	467	146	1202	558	222	738	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.0	58.6	58.9	46.8	46.9	38.2	63.0	36.1	43.1	58.1	27.0	27.0
Incr Delay (d2), s/veh	1.0	3.2	4.4	38.9	94.6	0.7	15.2	1.4	286.1	144.9	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.1	3.1	24.7	34.3	6.6	2.5	12.2	64.8	17.1	9.8	10.2
LnGrp Delay(d),s/veh	58.0	61.8	63.3	85.8	141.5	38.9	78.2	37.5	329.2	203.0	27.8	27.8
LnGrp LOS	E	E	E	F	F	D	E	D	F	F	C	C
Approach Vol, veh/h		199			1374			1740			1026	
Approach Delay, s/veh		61.8			104.2			190.1			75.3	
Approach LOS		E			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	52.0		16.2	9.9	63.1		44.0
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	17.0	47.0		28.0	11.0	53.0		39.5
Max Q Clear Time (g_c+I1), s	19.0	49.0		8.6	6.5	22.8		41.5
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	24.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	129.9
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	138	1045	15	15	1105	460	20	10	10	370	15	193
Future Volume (veh/h)	138	1045	15	15	1105	460	20	10	10	370	15	193
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1792	1863	1827	1900	1659	1900	1759	1769	1776
Adj Flow Rate, veh/h	159	1201	17	17	1270	0	23	11	11	437	0	222
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	1	1	6	2	4	0	12	12	8	0	7
Cap, veh/h	202	1658	23	27	1278	561	158	66	66	705	0	316
Arrive On Green	0.11	0.46	0.46	0.02	0.36	0.00	0.09	0.09	0.09	0.21	0.00	0.21
Sat Flow, veh/h	1774	3609	51	1707	3539	1553	1810	757	757	3351	0	1501
Grp Volume(v), veh/h	159	595	623	17	1270	0	23	0	22	437	0	222
Grp Sat Flow(s),veh/h/ln	1774	1787	1872	1707	1770	1553	1810	0	1513	1675	0	1501
Q Serve(g_s), s	7.5	23.1	23.2	0.9	30.7	0.0	1.0	0.0	1.2	10.2	0.0	11.8
Cycle Q Clear(g_c), s	7.5	23.1	23.2	0.9	30.7	0.0	1.0	0.0	1.2	10.2	0.0	11.8
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	202	821	860	27	1278	561	158	0	132	705	0	316
V/C Ratio(X)	0.79	0.72	0.72	0.64	0.99	0.00	0.15	0.00	0.17	0.62	0.00	0.70
Avail Cap(c_a), veh/h	207	821	860	99	1278	561	158	0	132	1249	0	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.0	18.8	18.8	42.0	27.3	0.0	36.2	0.0	36.3	30.8	0.0	31.4
Incr Delay (d2), s/veh	17.7	4.9	4.7	23.0	23.7	0.0	1.9	0.0	2.7	1.3	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	12.5	13.1	0.6	19.0	0.0	0.6	0.0	0.6	4.8	0.0	5.2
LnGrp Delay(d),s/veh	54.8	23.7	23.5	65.0	51.0	0.0	38.1	0.0	39.0	32.0	0.0	35.4
LnGrp LOS	D	C	C	E	D		D		D	C		D
Approach Vol, veh/h		1377			1287			45			659	
Approach Delay, s/veh		27.2			51.2			38.5			33.2	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.5	5.8	44.4		23.1	14.3	36.0
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.5	5.0	36.0		32.0	10.0	31.0
Max Q Clear Time (g_c+I1), s		3.2	2.9	25.2		13.8	9.5	32.7
Green Ext Time (p_c), s		0.0	0.0	10.7		3.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	930	465	330	1215	0	0	0	0	95	0	390
Future Volume (veh/h)	0	930	465	330	1215	0	0	0	0	95	0	390
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1810	1881	1845	0				1827	1827	1900
Adj Flow Rate, veh/h	0	1045	522	371	1365	0				107	0	438
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	2	5	1	3	0				4	0	4
Cap, veh/h	0	1255	544	404	2251	0				445	0	397
Arrive On Green	0.00	0.35	0.35	0.23	0.64	0.00				0.26	0.00	0.26
Sat Flow, veh/h	0	3632	1534	1792	3597	0				1740	0	1553
Grp Volume(v), veh/h	0	1045	522	371	1365	0				107	0	438
Grp Sat Flow(s),veh/h/ln	0	1770	1534	1792	1752	0				1740	0	1553
Q Serve(g_s), s	0.0	24.3	30.0	18.2	20.5	0.0				4.4	0.0	23.0
Cycle Q Clear(g_c), s	0.0	24.3	30.0	18.2	20.5	0.0				4.4	0.0	23.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1255	544	404	2251	0				445	0	397
V/C Ratio(X)	0.00	0.83	0.96	0.92	0.61	0.00				0.24	0.00	1.10
Avail Cap(c_a), veh/h	0	1255	544	426	2251	0				445	0	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.65	0.65	0.30	0.30	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.6	28.4	34.0	9.4	0.0				26.6	0.0	33.5
Incr Delay (d2), s/veh	0.0	4.4	22.9	9.1	0.4	0.0				0.1	0.0	76.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.7	16.1	10.0	10.0	0.0				2.1	0.0	18.2
LnGrp Delay(d),s/veh	0.0	31.0	51.3	43.2	9.8	0.0				26.7	0.0	109.7
LnGrp LOS		C	D	D	A					C		F
Approach Vol, veh/h		1567			1736						545	
Approach Delay, s/veh		37.8			16.9						93.4	
Approach LOS		D			B						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.9	37.0		27.1		62.9		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	21.4	30.8		23.0		57.8		
Max Q Clear Time (g_c+I1), s	20.2	32.0		25.0		22.5		
Green Ext Time (p_c), s	0.1	0.0		0.0		20.7		

Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
19: I-80 EB Ramps & Rocklin Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	835	0	0	990	65	555	5	1295	0	0	0
Future Volume (veh/h)	190	835	0	0	990	65	555	5	1295	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1863	0	0	1863	1863	1845	1878	1881			
Adj Flow Rate, veh/h	211	928	0	0	1100	72	413	0	1661			
Adj No. of Lanes	1	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	3	2	0	0	2	2	3	0	1			
Cap, veh/h	216	1654	0	0	1107	495	797	0	1451			
Arrive On Green	0.12	0.47	0.00	0.00	0.31	0.31	0.45	0.00	0.45			
Sat Flow, veh/h	1757	3632	0	0	3632	1583	1757	0	3198			
Grp Volume(v), veh/h	211	928	0	0	1100	72	413	0	1661			
Grp Sat Flow(s),veh/h/ln	1757	1770	0	0	1770	1583	1757	0	1599			
Q Serve(g_s), s	13.2	20.8	0.0	0.0	34.1	3.6	18.5	0.0	49.9			
Cycle Q Clear(g_c), s	13.2	20.8	0.0	0.0	34.1	3.6	18.5	0.0	49.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	216	1654	0	0	1107	495	797	0	1451			
V/C Ratio(X)	0.98	0.56	0.00	0.00	0.99	0.15	0.52	0.00	1.14			
Avail Cap(c_a), veh/h	216	1654	0	0	1107	495	797	0	1451			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.55	0.55	0.00	0.00	0.89	0.89	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.1	21.2	0.0	0.0	37.7	27.2	21.5	0.0	30.0			
Incr Delay (d2), s/veh	39.5	0.8	0.0	0.0	24.1	0.5	0.8	0.0	73.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.8	10.4	0.0	0.0	20.4	1.7	9.1	0.0	36.8			
LnGrp Delay(d),s/veh	87.6	21.9	0.0	0.0	61.8	27.8	22.3	0.0	103.9			
LnGrp LOS	F	C			E	C	C		F			
Approach Vol, veh/h		1139			1172			2074				
Approach Delay, s/veh		34.1			59.7			87.7				
Approach LOS		C			E			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		56.0			17.0	39.0		54.0
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		51.4			13.5	34.4		49.9
Max Q Clear Time (g_c+I1), s		22.8			15.2	36.1		51.9
Green Ext Time (p_c), s		13.2			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	66.3
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1895	185	31	745	0	310	0	71	0	0	0
Future Volume (veh/h)	50	1895	185	31	745	0	310	0	71	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1866	1900	1583	1863	0	1845	0	1638			
Adj Flow Rate, veh/h	57	2178	213	36	856	0	356	0	82			
Adj No. of Lanes	1	3	0	1	3	0	1	0	1			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87			
Percent Heavy Veh, %	0	1	1	20	2	0	3	0	16			
Cap, veh/h	103	2600	251	43	2660	0	409	0	324			
Arrive On Green	0.06	0.55	0.55	0.03	0.52	0.00	0.23	0.00	0.23			
Sat Flow, veh/h	1810	4715	454	1508	5253	0	1757	0	1392			
Grp Volume(v), veh/h	57	1560	831	36	856	0	356	0	82			
Grp Sat Flow(s),veh/h/ln	1810	1698	1773	1508	1695	0	1757	0	1392			
Q Serve(g_s), s	2.2	27.5	28.5	1.7	7.0	0.0	14.1	0.0	3.5			
Cycle Q Clear(g_c), s	2.2	27.5	28.5	1.7	7.0	0.0	14.1	0.0	3.5			
Prop In Lane	1.00		0.26	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	103	1873	977	43	2660	0	409	0	324			
V/C Ratio(X)	0.56	0.83	0.85	0.84	0.32	0.00	0.87	0.00	0.25			
Avail Cap(c_a), veh/h	151	1873	977	117	2752	0	524	0	415			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.1	13.4	13.7	34.8	9.9	0.0	26.6	0.0	22.5			
Incr Delay (d2), s/veh	4.6	3.9	8.2	32.3	0.2	0.0	12.1	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.2	13.8	16.1	1.1	3.3	0.0	8.2	0.0	1.4			
LnGrp Delay(d),s/veh	37.8	17.4	21.9	67.2	10.0	0.0	38.7	0.0	22.9			
LnGrp LOS	D	B	C	E	B		D		C			
Approach Vol, veh/h		2448			892			438				
Approach Delay, s/veh		19.4			12.3			35.8				
Approach LOS		B			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	6.1	44.7			8.1	42.7		21.3
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	39.4			6.0	39.0		21.5
Max Q Clear Time (g_c+I1), s	3.7	30.5			4.2	9.0		16.1
Green Ext Time (p_c), s	0.0	8.8			0.0	28.8		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	20	884	2161	5
Future Vol, veh/h	0	0	20	884	2161	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	21	931	2275	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1140	2280	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	170	92	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	170	92	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	92	-	-	-	-
HCM Lane V/C Ratio	0.229	-	-	-	-
HCM Control Delay (s)	55.4	-	0	-	-
HCM Lane LOS	F	-	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	215	35	205	355	160	70	93	40	105	393	90
Future Volume (veh/h)	120	215	35	205	355	160	70	93	40	105	393	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	130	234	38	223	386	174	76	101	43	114	427	98
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	430	70	263	403	182	98	667	270	144	852	194
Arrive On Green	0.09	0.27	0.27	0.15	0.33	0.33	0.05	0.27	0.27	0.08	0.30	0.30
Sat Flow, veh/h	1774	1564	254	1774	1217	549	1774	2461	996	1774	2865	652
Grp Volume(v), veh/h	130	0	272	223	0	560	76	71	73	114	262	263
Grp Sat Flow(s),veh/h/ln	1774	0	1818	1774	0	1766	1774	1770	1687	1774	1770	1748
Q Serve(g_s), s	5.7	0.0	10.2	9.8	0.0	24.8	3.4	2.4	2.6	5.0	9.8	9.9
Cycle Q Clear(g_c), s	5.7	0.0	10.2	9.8	0.0	24.8	3.4	2.4	2.6	5.0	9.8	9.9
Prop In Lane	1.00		0.14	1.00		0.31	1.00		0.59	1.00		0.37
Lane Grp Cap(c), veh/h	162	0	499	263	0	585	98	480	457	144	526	520
V/C Ratio(X)	0.80	0.00	0.54	0.85	0.00	0.96	0.78	0.15	0.16	0.79	0.50	0.51
Avail Cap(c_a), veh/h	166	0	499	306	0	585	140	480	457	166	526	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.43	0.00	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	24.7	33.2	0.0	26.2	37.3	22.1	22.2	36.1	23.2	23.2
Incr Delay (d2), s/veh	23.3	0.0	1.2	8.4	0.0	15.3	16.0	0.7	0.7	19.8	3.4	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	5.3	5.4	0.0	14.5	2.1	1.3	1.3	3.3	5.2	5.3
LnGrp Delay(d),s/veh	59.0	0.0	26.0	41.6	0.0	41.5	53.3	22.8	23.0	55.9	26.5	26.7
LnGrp LOS	E		C	D		D	D	C	C	E	C	C
Approach Vol, veh/h		402			783			220			639	
Approach Delay, s/veh		36.6			41.6			33.4			31.9	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	26.2	16.3	26.5	8.9	28.3	11.8	31.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	20.5	13.8	20.2	6.3	21.7	7.5	26.5
Max Q Clear Time (g_c+I1), s	7.0	4.6	11.8	12.2	5.4	11.9	7.7	26.8
Green Ext Time (p_c), s	0.0	3.7	0.1	3.4	0.0	2.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	715	1181	50	11	516	115	160	10	21	15	5	65
Future Volume (veh/h)	715	1181	50	11	516	115	160	10	21	15	5	65
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	777	1284	54	12	561	125	174	11	23	16	42	46
Adj No. of Lanes	1	3	0	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	812	2552	107	246	839	183	215	65	137	24	64	76
Arrive On Green	0.46	0.51	0.51	0.14	0.20	0.20	0.12	0.12	0.12	0.05	0.05	0.05
Sat Flow, veh/h	1774	5005	210	1774	4179	913	1774	538	1126	507	1331	1583
Grp Volume(v), veh/h	777	870	468	12	453	233	174	0	34	58	0	46
Grp Sat Flow(s),veh/h/ln	1774	1695	1826	1774	1695	1702	1774	0	1664	1837	0	1583
Q Serve(g_s), s	41.9	16.8	16.8	0.6	12.2	12.6	9.5	0.0	1.8	3.1	0.0	2.8
Cycle Q Clear(g_c), s	41.9	16.8	16.8	0.6	12.2	12.6	9.5	0.0	1.8	3.1	0.0	2.8
Prop In Lane	1.00		0.12	1.00		0.54	1.00		0.68	0.28		1.00
Lane Grp Cap(c), veh/h	812	1729	931	246	681	342	215	0	202	89	0	76
V/C Ratio(X)	0.96	0.50	0.50	0.05	0.67	0.68	0.81	0.00	0.17	0.65	0.00	0.60
Avail Cap(c_a), veh/h	877	2326	1253	246	821	412	537	0	504	93	0	80
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.9	16.0	16.0	37.0	36.5	36.7	42.4	0.0	39.0	46.3	0.0	46.2
Incr Delay (d2), s/veh	19.8	0.8	1.5	0.1	4.1	8.7	7.0	0.0	0.4	14.5	0.0	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.8	8.0	8.9	0.3	6.1	6.7	5.1	0.0	0.9	1.9	0.0	1.5
LnGrp Delay(d),s/veh	45.8	16.8	17.5	37.1	40.7	45.3	49.4	0.0	39.4	60.8	0.0	57.4
LnGrp LOS	D	B	B	D	D	D	D		D	E		E
Approach Vol, veh/h		2115			698			208			104	
Approach Delay, s/veh		27.6			42.2			47.8			59.3	
Approach LOS		C			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.7	55.5		16.0	49.4	24.9		8.8
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 68		30.0	49.0	24.0		5.0
Max Q Clear Time (g_c+I1), s	2.6	18.8		11.5	43.9	14.6		5.1
Green Ext Time (p_c), s	1.6	31.8		0.6	1.5	5.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	33.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	0	33	153	0	54	93	825	155	54	2070	37
Future Volume (veh/h)	13	0	33	153	0	54	93	825	155	54	2070	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	14	0	36	166	0	59	101	897	168	59	2250	40
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	30	0	95	246	0	181	129	2960	1035	84	2864	51
Arrive On Green	0.02	0.00	0.06	0.07	0.00	0.11	0.07	0.58	0.58	0.05	0.56	0.56
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5146	91
Grp Volume(v), veh/h	14	0	36	166	0	59	101	897	168	59	1481	809
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1847
Q Serve(g_s), s	0.6	0.0	1.6	3.5	0.0	2.6	4.2	6.7	3.1	2.5	25.8	26.0
Cycle Q Clear(g_c), s	0.6	0.0	1.6	3.5	0.0	2.6	4.2	6.7	3.1	2.5	25.8	26.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	30	0	95	246	0	181	129	2960	1035	84	1887	1028
V/C Ratio(X)	0.47	0.00	0.38	0.67	0.00	0.33	0.78	0.30	0.16	0.71	0.78	0.79
Avail Cap(c_a), veh/h	118	0	379	261	0	394	154	2960	1035	172	1887	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	0.0	34.0	34.0	0.0	30.6	34.2	8.0	5.0	35.3	13.1	13.1
Incr Delay (d2), s/veh	10.9	0.0	2.5	6.2	0.0	1.0	19.5	0.3	0.3	10.3	3.4	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.8	1.9	0.0	1.2	2.7	3.1	1.4	1.5	12.8	14.8
LnGrp Delay(d),s/veh	47.5	0.0	36.5	40.3	0.0	31.6	53.8	8.2	5.4	45.6	16.5	19.2
LnGrp LOS	D		D	D		C	D	A	A	D	B	B
Approach Vol, veh/h		50			225			1166			2349	
Approach Delay, s/veh		39.6			38.0			11.8			18.2	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	48.2	9.9	9.0	10.0	46.3	5.8	13.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.3	41.0	5.7	18.0	6.5	41.8	5.0	18.7
Max Q Clear Time (g_c+I1), s	4.5	8.7	5.5	3.6	6.2	28.0	2.6	4.6
Green Ext Time (p_c), s	0.0	29.1	0.0	0.4	0.0	13.1	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	0	0	517	0	0
Future Vol, veh/h	105	0	0	517	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	0	0	562	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	114
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	939
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	939
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	210	968	431	400	0	478	0	86	5	0	5
Future Volume (veh/h)	0	210	968	431	400	0	478	0	86	5	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1681	1810	1776	1681	1900	1743	1827	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	233	0	479	444	0	531	0	96	6	0	6
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	13	5	7	13	13	9	0	0	0	0	0
Cap, veh/h	2	318	291	502	884	0	564	0	527	25	0	22
Arrive On Green	0.00	0.19	0.00	0.30	0.53	0.00	0.34	0.00	0.34	0.01	0.00	0.01
Sat Flow, veh/h	1810	1681	1538	1691	1681	0	1660	0	1553	1810	0	1615
Grp Volume(v), veh/h	0	233	0	479	444	0	531	0	96	6	0	6
Grp Sat Flow(s),veh/h/ln	1810	1681	1538	1691	1681	0	1660	0	1553	1810	0	1615
Q Serve(g_s), s	0.0	14.6	0.0	31.1	19.0	0.0	34.7	0.0	4.9	0.4	0.0	0.4
Cycle Q Clear(g_c), s	0.0	14.6	0.0	31.1	19.0	0.0	34.7	0.0	4.9	0.4	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	318	291	502	884	0	564	0	527	25	0	22
V/C Ratio(X)	0.00	0.73	0.00	0.95	0.50	0.00	0.94	0.00	0.18	0.24	0.00	0.27
Avail Cap(c_a), veh/h	81	624	571	507	1052	0	623	0	583	81	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.7	0.0	38.6	17.1	0.0	35.9	0.0	26.0	54.6	0.0	54.6
Incr Delay (d2), s/veh	0.0	3.3	0.0	28.8	0.4	0.0	21.7	0.0	0.2	4.8	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.1	0.0	18.5	8.9	0.0	19.3	0.0	2.1	0.2	0.0	0.2
LnGrp Delay(d),s/veh	0.0	46.0	0.0	67.3	17.5	0.0	57.5	0.0	26.2	59.3	0.0	60.8
LnGrp LOS		D		E	B		E		C	E		E
Approach Vol, veh/h		233			923			627			12	
Approach Delay, s/veh		46.0			43.4			52.7			60.0	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		42.5	37.7	25.6		6.1	0.0	63.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.0	33.5	41.5		5.0	5.0	70.0
Max Q Clear Time (g_c+I1), s		36.7	33.1	16.6		2.4	0.0	21.0
Green Ext Time (p_c), s		1.2	0.1	4.5		0.0	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	47.1
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
27: Sierra College Boulevard/Sierra College Blvd & English Colony Way

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	195	586	11	275	1871
Future Volume (veh/h)	6	195	586	11	275	1871
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1746	1900	1881	1845
Adj Flow Rate, veh/h	7	214	644	12	302	2056
Adj No. of Lanes	0	0	2	0	1	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	9	9	1	3
Cap, veh/h	8	258	1468	27	352	2465
Arrive On Green	0.16	0.16	0.44	0.44	0.20	0.70
Sat Flow, veh/h	51	1563	3419	62	1792	3597
Grp Volume(v), veh/h	222	0	321	335	302	2056
Grp Sat Flow(s),veh/h/ln	1622	0	1658	1735	1792	1752
Q Serve(g_s), s	9.0	0.0	9.1	9.2	11.1	28.8
Cycle Q Clear(g_c), s	9.0	0.0	9.1	9.2	11.1	28.8
Prop In Lane	0.03	0.96		0.04	1.00	
Lane Grp Cap(c), veh/h	268	0	731	765	352	2465
V/C Ratio(X)	0.83	0.00	0.44	0.44	0.86	0.83
Avail Cap(c_a), veh/h	428	0	731	765	444	2465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	13.2	13.2	26.5	7.3
Incr Delay (d2), s/veh	7.4	0.0	1.9	1.8	12.8	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	4.6	4.8	6.7	14.6
LnGrp Delay(d),s/veh	34.9	0.0	15.1	15.1	39.3	10.8
LnGrp LOS	C		B	B	D	B
Approach Vol, veh/h	222		656			2358
Approach Delay, s/veh	34.9		15.1			14.4
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.9	34.6				52.5		15.8
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	16.9	26.6				48.0		18.0
Max Q Clear Time (g_c+I1), s	13.1	11.2				30.8		11.0
Green Ext Time (p_c), s	0.3	14.0				15.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	82

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	0	136	5	225	0	651	11	30	1766	5
Future Vol, veh/h	5	0	0	136	5	225	0	651	11	30	1766	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	6	0	0	160	6	265	0	766	13	35	2078	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2537	2930	1042	1881	2926	389	2084	0	0	779	0	0
Stage 1	2151	2151	-	772	772	-	-	-	-	-	-	-
Stage 2	386	779	-	1109	2154	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	14	15	230	~ 45	15	615	270	-	-	847	-	-
Stage 1	50	89	-	363	412	-	-	-	-	-	-	-
Stage 2	614	409	-	227	88	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 5	14	230	~ 44	14	615	270	-	-	847	-	-
Mov Cap-2 Maneuver	~ 5	14	-	~ 44	14	-	-	-	-	-	-	-
Stage 1	50	85	-	363	412	-	-	-	-	-	-	-
Stage 2	345	409	-	218	84	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1383.4	$ 614.8	0	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	270	-	-	5	-	41	615	847	-	-
HCM Lane V/C Ratio	-	-	-	1.176	-	4.046	0.43	0.042	-	-
HCM Control Delay (s)	0	-	$	1383.4	$	1571.6	15.2	9.4	-	-
HCM Lane LOS	A	-	-	F	A	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	-	18.9	2.2	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	15	116	105	40	15	126	206	30	10	626	270
Future Volume (veh/h)	80	15	116	105	40	15	126	206	30	10	626	270
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1813	1792	1900	1900	1900	1810	1768	1900	1900	1845	1759
Adj Flow Rate, veh/h	99	19	143	130	49	19	156	254	37	12	773	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	9	9	6	0	0	0	5	8	8	0	3	8
Cap, veh/h	172	33	180	156	59	23	184	836	122	26	852	691
Arrive On Green	0.12	0.12	0.12	0.13	0.13	0.13	0.11	0.55	0.55	0.01	0.46	0.00
Sat Flow, veh/h	1460	280	1524	1188	448	174	1723	1509	220	1810	1845	1495
Grp Volume(v), veh/h	118	0	143	198	0	0	156	0	291	12	773	0
Grp Sat Flow(s),veh/h/ln	1740	0	1524	1810	0	0	1723	0	1729	1810	1845	1495
Q Serve(g_s), s	6.3	0.0	9.0	10.5	0.0	0.0	8.8	0.0	8.9	0.6	38.3	0.0
Cycle Q Clear(g_c), s	6.3	0.0	9.0	10.5	0.0	0.0	8.8	0.0	8.9	0.6	38.3	0.0
Prop In Lane	0.84		1.00	0.66		0.10	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	180	237	0	0	184	0	958	26	852	691
V/C Ratio(X)	0.58	0.00	0.80	0.83	0.00	0.00	0.85	0.00	0.30	0.47	0.91	0.00
Avail Cap(c_a), veh/h	318	0	278	331	0	0	184	0	958	92	852	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.1	0.0	42.3	41.8	0.0	0.0	43.2	0.0	11.8	48.2	24.6	0.0
Incr Delay (d2), s/veh	2.5	0.0	8.5	12.2	0.0	0.0	29.4	0.0	0.8	12.6	15.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	4.2	6.1	0.0	0.0	5.7	0.0	4.4	0.4	22.9	0.0
LnGrp Delay(d),s/veh	43.7	0.0	50.8	53.9	0.0	0.0	72.7	0.0	12.6	60.8	39.8	0.0
LnGrp LOS	D		D	D			E		B	E	D	
Approach Vol, veh/h		261			198			447			785	
Approach Delay, s/veh		47.6			53.9			33.6			40.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	59.1		16.1	15.0	50.0		17.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	51.0		18.0	10.5	45.5		18.0
Max Q Clear Time (g_c+I1), s	2.6	10.9		11.0	10.8	40.3		12.5
Green Ext Time (p_c), s	0.0	9.5		0.6	0.0	3.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	41.1
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	17	340	938	0
Future Vol, veh/h	0	9	17	340	938	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	6	5	0
Mvmt Flow	0	12	23	459	1268	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1773	1268	1268	0	-	0
Stage 1	1268	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	92	208	555	-	-	-
Stage 1	267	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	88	208	555	-	-	-
Mov Cap-2 Maneuver	88	-	-	-	-	-
Stage 1	267	-	-	-	-	-
Stage 2	585	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.4	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	555	-	208	-	-
HCM Lane V/C Ratio	0.041	-	0.058	-	-
HCM Control Delay (s)	11.8	-	23.4	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	95	262	46	185	762
Future Volume (veh/h)	51	95	262	46	185	762
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1832	1900	1810	1827
Adj Flow Rate, veh/h	72	134	369	65	261	1073
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Percent Heavy Veh, %	0	0	4	4	5	4
Cap, veh/h	87	163	741	130	305	1328
Arrive On Green	0.15	0.15	0.49	0.49	0.18	0.73
Sat Flow, veh/h	584	1087	1518	267	1723	1827
Grp Volume(v), veh/h	207	0	0	434	261	1073
Grp Sat Flow(s),veh/h/ln	1679	0	0	1785	1723	1827
Q Serve(g_s), s	8.7	0.0	0.0	12.0	10.7	28.3
Cycle Q Clear(g_c), s	8.7	0.0	0.0	12.0	10.7	28.3
Prop In Lane	0.35	0.65		0.15	1.00	
Lane Grp Cap(c), veh/h	251	0	0	871	305	1328
V/C Ratio(X)	0.82	0.00	0.00	0.50	0.85	0.81
Avail Cap(c_a), veh/h	415	0	0	871	390	1328
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	0.0	0.0	12.6	29.1	6.6
Incr Delay (d2), s/veh	6.7	0.0	0.0	2.0	13.8	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	0.0	6.4	6.2	16.0
LnGrp Delay(d),s/veh	36.8	0.0	0.0	14.7	42.9	11.9
LnGrp LOS	D			B	D	B
Approach Vol, veh/h	207		434			1334
Approach Delay, s/veh	36.8		14.7			18.0
Approach LOS	D		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.4	40.1				57.5		15.4
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	16.5	32.0				53.0		18.0
Max Q Clear Time (g_c+I1), s	12.7	14.0				30.3		10.7
Green Ext Time (p_c), s	0.3	11.3				13.1		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	55

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	55	45	278	160	170	717
Future Vol, veh/h	55	45	278	160	170	717
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	60	60	60	60
Heavy Vehicles, %	0	0	3	1	0	2
Mvmt Flow	92	75	463	267	283	1195

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2359	597	0	0	730	0
Stage 1	597	-	-	-	-	-
Stage 2	1762	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 40	507	-	-	883	-
Stage 1	554	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 27	507	-	-	883	-
Mov Cap-2 Maneuver	~ 27	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	104	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 765	0	2.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	27	507	883	-
HCM Lane V/C Ratio	-	-	3.395	0.148	0.321	-
HCM Control Delay (s)	-	-	$ 1380.1	13.3	11	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	11.2	0.5	1.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	252.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	127	0	103	3	335	129	109	659	4
Future Vol, veh/h	0	0	3	127	0	103	3	335	129	109	659	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	2	0
Mvmt Flow	0	0	4	187	0	151	4	493	190	160	969	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1965	1984	972	1891	1892	588	975	0	0	682	0	0
Stage 1	1293	1293	-	596	596	-	-	-	-	-	-	-
Stage 2	672	691	-	1295	1296	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	48	62	309	~ 54	71	513	716	-	-	920	-	-
Stage 1	202	235	-	494	495	-	-	-	-	-	-	-
Stage 2	449	449	-	202	234	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	51	309	~ 46	58	513	716	-	-	920	-	-
Mov Cap-2 Maneuver	29	51	-	~ 46	58	-	-	-	-	-	-	-
Stage 1	201	194	-	491	492	-	-	-	-	-	-	-
Stage 2	315	446	-	~ 164	193	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	$ 1610.3	0.1	1.4
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	716	-	-	309	78	920	-	-
HCM Lane V/C Ratio	0.006	-	-	0.014	4.336	0.174	-	-
HCM Control Delay (s)	10.1	-	-	16.8	$ 1610.3	9.7	-	-
HCM Lane LOS	B	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	36	0.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	24.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	161	60	407	304	111	678
Future Vol, veh/h	161	60	407	304	111	678
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	3	1	1	2
Mvmt Flow	218	81	550	411	150	916

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1971	755	0	0	961	0
Stage 1	755	-	-	-	-	-
Stage 2	1216	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	~ 70	412	-	-	720	-
Stage 1	468	-	-	-	-	-
Stage 2	283	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 55	412	-	-	720	-
Mov Cap-2 Maneuver	~ 160	-	-	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	224	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	187.2	0	1.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	160	412	720	-
HCM Lane V/C Ratio	-	-	1.36	0.197	0.208	-
HCM Control Delay (s)	-	-	251	15.9	11.3	-
HCM Lane LOS	-	-	F	C	B	-
HCM 95th %tile Q(veh)	-	-	13.3	0.7	0.8	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	38	56	709	845	0
Future Vol, veh/h	1	38	56	709	845	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	19	9	3	3	0
Mvmt Flow	1	51	76	958	1142	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2251	1142	1142	0	-	0
Stage 1	1142	-	-	-	-	-
Stage 2	1109	-	-	-	-	-
Critical Hdwy	6.4	6.39	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.471	2.281	-	-	-
Pot Cap-1 Maneuver	46	225	587	-	-	-
Stage 1	307	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	40	225	587	-	-	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	307	-	-	-	-	-
Stage 2	277	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.2	0.9	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	587	-	222	-	-
HCM Lane V/C Ratio	0.129	-	0.237	-	-
HCM Control Delay (s)	12	-	26.2	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.4	-	0.9	-	-

Intersection	
Int Delay, s/veh	35.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	221	5	0	10	86	876	5	25	1091	15
Future Vol, veh/h	0	0	221	5	0	10	86	876	5	25	1091	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	7	3	4	0	0	6	20
Mvmt Flow	0	0	233	5	0	11	91	922	5	26	1148	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	1148	2307	2307	925	1148	0	0	927	0	0
Stage 1	-	-	-	1106	1106	-	-	-	-	-	-	-
Stage 2	-	-	-	1201	1201	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.22	7.1	6.5	6.27	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.318	3.5	4	3.363	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	242	27	39	319	605	-	-	746	-	-
Stage 1	0	0	-	258	289	-	-	-	-	-	-	-
Stage 2	0	0	-	228	260	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	242	~ 1	32	319	605	-	-	746	-	-
Mov Cap-2 Maneuver	-	-	-	~ 1	32	-	-	-	-	-	-	-
Stage 1	-	-	-	219	246	-	-	-	-	-	-	-
Stage 2	-	-	-	9	251	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	91.9	$ 4103.8	1.1	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	605	-	-	242	3	746	-	-
HCM Lane V/C Ratio	0.15	-	-	0.961	5.263	0.035	-	-
HCM Control Delay (s)	12	-	-	91.9	$ 4103.8	10	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	8.8	3.4	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	1	3	515	5	4
Future Vol, veh/h	105	1	3	515	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	1	3	560	5	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	115	0	681	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1474	-	416	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1474	-	415	937
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	567	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	617	-	-	1474	-
HCM Lane V/C Ratio	0.016	-	-	0.002	-
HCM Control Delay (s)	10.9	-	-	7.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	240	496	84	70	40	416	395	324	65	275	65
Future Volume (veh/h)	90	240	496	84	70	40	416	395	324	65	275	65
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1827	1845	1827	1817	1900	1759	1845	1845	1863	1823	1900
Adj Flow Rate, veh/h	101	270	557	94	79	45	467	444	364	73	309	73
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	5	4	3	4	6	6	8	3	3	2	5	5
Cap, veh/h	454	481	404	196	122	69	498	750	629	94	435	101
Arrive On Green	0.26	0.26	0.26	0.11	0.11	0.11	0.30	0.41	0.41	0.05	0.16	0.16
Sat Flow, veh/h	1723	1827	1534	1740	1079	614	1675	1845	1547	1774	2758	639
Grp Volume(v), veh/h	101	270	557	94	0	124	467	444	364	73	192	190
Grp Sat Flow(s),veh/h/ln	1723	1827	1534	1740	0	1693	1675	1845	1547	1774	1732	1665
Q Serve(g_s), s	4.9	13.6	28.0	5.4	0.0	7.5	28.9	20.0	19.4	4.3	11.2	11.6
Cycle Q Clear(g_c), s	4.9	13.6	28.0	5.4	0.0	7.5	28.9	20.0	19.4	4.3	11.2	11.6
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	454	481	404	196	0	191	498	750	629	94	273	262
V/C Ratio(X)	0.22	0.56	1.38	0.48	0.00	0.65	0.94	0.59	0.58	0.78	0.70	0.73
Avail Cap(c_a), veh/h	454	481	404	458	0	446	559	789	661	183	334	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	33.9	39.2	44.3	0.0	45.2	36.4	24.7	24.5	49.8	42.5	42.6
Incr Delay (d2), s/veh	0.1	0.9	185.8	0.7	0.0	1.4	22.4	0.7	0.7	5.2	3.3	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	6.9	32.7	2.6	0.0	3.6	16.5	10.3	8.4	2.3	5.6	5.7
LnGrp Delay(d),s/veh	30.8	34.8	225.0	44.9	0.0	46.6	58.9	25.3	25.2	55.0	45.8	47.0
LnGrp LOS	C	C	F	D		D	E	C	C	D	D	D
Approach Vol, veh/h		928			218			1275			455	
Approach Delay, s/veh		148.5			45.9			37.6			47.8	
Approach LOS		F			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.6	48.8		32.0	36.1	22.3		16.0
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	11.0	45.5		28.0	35.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	6.3	22.0		30.0	30.9	13.6		9.5
Green Ext Time (p_c), s	0.0	4.3		0.0	0.7	2.6		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	75.6
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	30	20	65	10	460	20	779	105	555	699	15
Future Volume (veh/h)	15	30	20	65	10	460	20	779	105	555	699	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1837	1845	1900	1845	1827	1863	1864	1900
Adj Flow Rate, veh/h	16	32	21	69	11	489	21	829	112	590	744	16
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	3	0	3	4	2	2	2
Cap, veh/h	41	74	36	144	20	732	26	824	687	596	1394	30
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.01	0.45	0.45	0.34	0.77	0.77
Sat Flow, veh/h	74	557	276	728	148	1556	1810	1845	1539	1774	1816	39
Grp Volume(v), veh/h	69	0	0	80	0	489	21	829	112	590	0	760
Grp Sat Flow(s),veh/h/ln	907	0	0	876	0	1556	1810	1845	1539	1774	0	1855
Q Serve(g_s), s	0.4	0.0	0.0	0.0	0.0	18.5	1.6	62.5	6.1	46.3	0.0	22.6
Cycle Q Clear(g_c), s	14.9	0.0	0.0	14.6	0.0	18.5	1.6	62.5	6.1	46.3	0.0	22.6
Prop In Lane	0.23		0.30	0.86		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	152	0	0	164	0	732	26	824	687	596	0	1424
V/C Ratio(X)	0.46	0.00	0.00	0.49	0.00	0.67	0.80	1.01	0.16	0.99	0.00	0.53
Avail Cap(c_a), veh/h	152	0	0	164	0	732	75	824	687	596	0	1424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.1	0.0	0.0	58.9	0.0	28.9	68.8	38.8	23.1	46.3	0.0	6.4
Incr Delay (d2), s/veh	2.1	0.0	0.0	2.3	0.0	2.3	18.7	33.0	0.1	34.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	3.1	0.0	15.1	0.9	39.3	2.6	28.3	0.0	11.6
LnGrp Delay(d),s/veh	57.2	0.0	0.0	61.1	0.0	31.2	87.5	71.8	23.2	80.7	0.0	6.8
LnGrp LOS	E			E		C	F	F	C	F		A
Approach Vol, veh/h		69			569			962			1350	
Approach Delay, s/veh		57.2			35.4			66.5			39.1	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	51.0	66.5		22.5	6.0	111.5		22.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	47.0	62.5		18.5	5.8	103.7		18.5
Max Q Clear Time (g_c+I1), s	48.3	64.5		16.9	3.6	24.6		20.5
Green Ext Time (p_c), s	0.0	0.0		0.5	0.0	21.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	47.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	35	60	85	50	75	215	805	155	50	205	575
Future Volume (veh/h)	70	35	60	85	50	75	215	805	155	50	205	575
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1877	1900	1827	1850	1900	1900	1845	1863
Adj Flow Rate, veh/h	74	37	64	90	53	80	229	856	165	53	218	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	0	0	4	3	3	0	3	2
Cap, veh/h	136	68	183	214	81	122	287	1217	235	96	557	478
Arrive On Green	0.11	0.11	0.11	0.12	0.12	0.12	0.16	0.41	0.41	0.05	0.30	0.00
Sat Flow, veh/h	1202	601	1615	1792	676	1021	1740	2941	567	1810	1845	1583
Grp Volume(v), veh/h	111	0	64	90	0	133	229	512	509	53	218	0
Grp Sat Flow(s),veh/h/ln	1803	0	1615	1792	0	1697	1740	1758	1750	1810	1845	1583
Q Serve(g_s), s	2.8	0.0	1.7	2.2	0.0	3.6	6.0	11.5	11.5	1.4	4.5	0.0
Cycle Q Clear(g_c), s	2.8	0.0	1.7	2.2	0.0	3.6	6.0	11.5	11.5	1.4	4.5	0.0
Prop In Lane	0.67		1.00	1.00		0.60	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	205	0	183	214	0	203	287	727	724	96	557	478
V/C Ratio(X)	0.54	0.00	0.35	0.42	0.00	0.66	0.80	0.70	0.70	0.55	0.39	0.00
Avail Cap(c_a), veh/h	965	0	865	692	0	656	713	1300	1294	251	864	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.9	0.0	19.5	19.4	0.0	20.0	19.1	11.5	11.5	22.0	13.2	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.4	0.5	0.0	1.3	2.0	0.7	0.7	1.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.8	1.1	0.0	1.7	3.0	5.7	5.7	0.7	2.3	0.0
LnGrp Delay(d),s/veh	20.8	0.0	19.9	19.9	0.0	21.4	21.1	12.2	12.2	23.8	13.4	0.0
LnGrp LOS	C		B	B		C	C	B	B	C	B	
Approach Vol, veh/h		175			223			1250			271	
Approach Delay, s/veh		20.4			20.8			13.8			15.4	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	23.4		8.9	10.8	18.1		9.8
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.6	35.2		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	3.4	13.5		4.8	8.0	6.5		5.6
Green Ext Time (p_c), s	0.0	6.2		0.4	0.2	5.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	379.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	305	530	645	325	100	250
Future Vol, veh/h	305	530	645	325	100	250
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	3	3	2	4	1
Mvmt Flow	328	570	694	349	108	269

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1178	694	0	0	694	0
Stage 1	694	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.41	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	~ 212	~ 441	-	-	892	-
Stage 1	498	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 182	~ 441	-	-	892	-
Mov Cap-2 Maneuver	~ 182	-	-	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s$	978.6	0	2.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	290	892	-
HCM Lane V/C Ratio	-	-	3.096	0.121	-
HCM Control Delay (s)	-	-	$ 978.6	9.6	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	80.2	0.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	589	62	55	184	37	155
Future Vol, veh/h	589	62	55	184	37	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	6	5	4
Mvmt Flow	640	67	60	200	40	168

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	708	0	994	674
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	-	-	4.12	-	6.45	6.24
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.336
Pot Cap-1 Maneuver	-	-	891	-	268	451
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	891	-	248	451
Mov Cap-2 Maneuver	-	-	-	-	248	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	24.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	390	-	-	891	-
HCM Lane V/C Ratio	0.535	-	-	0.067	-
HCM Control Delay (s)	24.4	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	320	260	519	190	70	151	1490	574	35	959	70
Future Volume (veh/h)	135	320	260	519	190	70	151	1490	574	35	959	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1827	1845	1845	1863	1810	1810	1881	1845	1743	1863	1810
Adj Flow Rate, veh/h	147	348	283	564	207	76	164	1620	624	38	1042	76
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	4	3	3	2	5	5	1	3	9	2	5
Cap, veh/h	174	347	298	547	472	385	188	1665	982	47	1363	742
Arrive On Green	0.10	0.19	0.19	0.16	0.25	0.25	0.11	0.47	0.47	0.03	0.39	0.39
Sat Flow, veh/h	1792	1827	1568	3408	1863	1518	1723	3574	1568	1660	3539	1538
Grp Volume(v), veh/h	147	348	283	564	207	76	164	1620	624	38	1042	76
Grp Sat Flow(s),veh/h/ln	1792	1827	1568	1704	1863	1518	1723	1787	1568	1660	1770	1538
Q Serve(g_s), s	10.4	24.5	23.0	20.7	12.0	5.1	12.1	57.1	31.8	2.9	33.1	3.5
Cycle Q Clear(g_c), s	10.4	24.5	23.0	20.7	12.0	5.1	12.1	57.1	31.8	2.9	33.1	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	347	298	547	472	385	188	1665	982	47	1363	742
V/C Ratio(X)	0.84	1.00	0.95	1.03	0.44	0.20	0.87	0.97	0.64	0.80	0.76	0.10
Avail Cap(c_a), veh/h	261	347	298	547	472	385	194	1665	982	64	1381	750
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	52.2	51.6	54.1	40.4	37.8	56.5	33.6	14.9	62.3	34.5	18.2
Incr Delay (d2), s/veh	14.6	48.9	39.4	46.5	1.4	0.5	32.0	16.2	1.9	38.8	3.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	17.1	13.2	13.3	6.4	2.2	7.4	31.9	14.2	1.9	16.6	1.5
LnGrp Delay(d),s/veh	71.9	101.1	91.0	100.6	41.8	38.3	88.5	49.9	16.9	101.1	37.6	18.3
LnGrp LOS	E	F	F	F	D	D	F	D	B	F	D	B
Approach Vol, veh/h		778			847			2408			1156	
Approach Delay, s/veh		91.9			80.7			43.9			38.4	
Approach LOS		F			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	65.5	25.2	30.0	18.6	55.2	17.0	38.2
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	59.8	20.7	24.5	14.5	50.3	18.8	26.4
Max Q Clear Time (g_c+I1), s	4.9	59.1	22.7	26.5	14.1	35.1	12.4	14.0
Green Ext Time (p_c), s	0.0	0.7	0.0	0.0	0.0	14.6	0.2	6.5

Intersection Summary	
HCM 2010 Ctrl Delay	55.9
HCM 2010 LOS	E

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	545	105	0	133	0	2107	375	322	1301	115
Future Volume (vph)	0	0	545	105	0	133	0	2107	375	322	1301	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.99	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1604	1770		1553		5085	1615	1787	5031	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1604	1770		1553		5085	1615	1787	5031	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	568	109	0	139	0	2195	391	335	1355	120
RTOR Reduction (vph)	0	0	70	0	0	93	0	0	131	0	8	0
Lane Group Flow (vph)	0	0	498	109	0	46	0	2195	260	335	1467	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			31.0	7.5		43.0		52.5	60.0	21.0	77.5	
Effective Green, g (s)			31.0	7.5		43.0		52.5	60.0	21.0	77.5	
Actuated g/C Ratio			0.24	0.06		0.33		0.40	0.46	0.16	0.60	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			382	102		513		2053	745	288	2999	
v/s Ratio Prot				c0.06				c0.43	0.02	c0.19	0.29	
v/s Ratio Perm			c0.31			0.03			0.14			
v/c Ratio			1.30	1.07		0.09		1.07	0.35	1.16	0.49	
Uniform Delay, d1			49.5	61.2		30.0		38.8	22.5	54.5	15.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			154.5	108.8		0.1		41.3	0.3	104.7	0.2	
Delay (s)			204.0	170.1		30.1		80.1	22.7	159.2	15.1	
Level of Service			F	F		C		F	C	F	B	
Approach Delay (s)		204.0			91.6			71.4			41.8	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	76.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	25	285	120	30	90	220	2150	55	100	1861	194
Future Volume (veh/h)	424	25	285	120	30	90	220	2150	55	100	1861	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1863	1863	1863	1881
Adj Flow Rate, veh/h	451	27	303	128	32	96	234	2287	59	106	1980	206
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	424	429	641	156	163	136	265	1664	744	131	1985	615
Arrive On Green	0.23	0.23	0.23	0.09	0.09	0.09	0.15	0.47	0.47	0.07	0.39	0.39
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	3539	1582	1774	5085	1577
Grp Volume(v), veh/h	451	27	303	128	32	96	234	2287	59	106	1980	206
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1770	1582	1774	1695	1577
Q Serve(g_s), s	30.0	1.5	12.2	9.2	2.1	7.8	17.0	60.2	2.6	7.5	49.8	11.7
Cycle Q Clear(g_c), s	30.0	1.5	12.2	9.2	2.1	7.8	17.0	60.2	2.6	7.5	49.8	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	424	429	641	156	163	136	265	1664	744	131	1985	615
V/C Ratio(X)	1.06	0.06	0.47	0.82	0.20	0.71	0.88	1.37	0.08	0.81	1.00	0.33
Avail Cap(c_a), veh/h	424	429	641	411	428	357	605	1664	744	277	1985	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.0	38.1	42.2	57.4	54.1	56.7	53.1	33.9	18.7	58.4	39.0	27.4
Incr Delay (d2), s/veh	61.8	0.1	0.5	10.3	0.6	6.6	9.4	172.4	0.1	11.0	19.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.2	0.7	4.7	4.9	1.1	3.5	8.8	69.2	1.2	4.1	26.9	5.2
LnGrp Delay(d),s/veh	110.9	38.1	42.7	67.6	54.7	63.4	62.5	206.3	18.8	69.4	58.6	28.1
LnGrp LOS	F	D	D	E	D	E	E	F	B	E	E	C
Approach Vol, veh/h		781			256			2580			2292	
Approach Delay, s/veh		81.9			64.4			189.0			56.3	
Approach LOS		F			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	65.2	15.3	34.1	23.7	55.0	34.0	15.4
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	9.5	62.2	11.2	14.2	19.0	51.8	32.0	9.8
Green Ext Time (p_c), s	0.2	0.0	0.3	1.7	0.7	0.0	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	118.0
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	0	120	1035	70	392	305	1968	255	0	2231	35
Future Volume (veh/h)	35	0	120	1035	70	392	305	1968	255	0	2231	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1825	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	37	0	128	1101	0	466	324	2094	271	0	2373	37
Adj No. of Lanes	1	0	1	2	0	2	1	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	49	0	0	1146	0	809	285	2995	942	0	1966	642
Arrive On Green	0.03	0.00	0.00	0.33	0.00	0.26	0.32	1.00	1.00	0.00	0.40	0.40
Sat Flow, veh/h	1810	37		3514	0	3076	1792	5036	1583	0	5055	1599
Grp Volume(v), veh/h	37	87.5		1101	0	466	324	2094	271	0	2373	37
Grp Sat Flow(s),veh/h/ln	1810	F		1757	0	1538	1792	1679	1583	0	1631	1599
Q Serve(g_s), s	2.8			43.1	0.0	18.4	22.3	0.0	0.0	0.0	56.3	2.0
Cycle Q Clear(g_c), s	2.8			43.1	0.0	18.4	22.3	0.0	0.0	0.0	56.3	2.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	49			1146	0	809	285	2995	942	0	1966	642
V/C Ratio(X)	0.75			0.96	0.00	0.58	1.14	0.70	0.29	0.00	1.21	0.06
Avail Cap(c_a), veh/h	65			1230	0	857	285	2995	942	0	1966	642
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.42	0.42
Uniform Delay (d), s/veh	67.6			46.3	0.0	44.8	47.7	0.0	0.0	0.0	41.9	25.6
Incr Delay (d2), s/veh	19.9			16.2	0.0	0.5	94.9	1.4	0.8	0.0	95.3	0.1
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7			23.5	0.0	7.9	18.5	0.4	0.2	0.0	42.7	0.9
LnGrp Delay(d),s/veh	87.5			62.5	0.0	45.3	142.6	1.4	0.8	0.0	137.2	25.7
LnGrp LOS	F			E		D	F	A	A		F	C
Approach Vol, veh/h					1567			2689			2410	
Approach Delay, s/veh					57.4			18.3			135.5	
Approach LOS					E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		89.5	50.5		27.0	62.5	8.4	42.1
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		79.9	49.0		* 22	52.9	5.0	39.0
Max Q Clear Time (g_c+I1), s		2.0	45.1		24.3	58.3	4.8	20.4
Green Ext Time (p_c), s		45.2	0.6		0.0	0.0	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	70.0
HCM 2010 LOS	E

Notes

HCM 2010 Signalized Intersection Summary
10: Sierra College Blvd & I-80 EB Ramps

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	624	180	100	125	0	310	0	2459	160	270	1555	521
Future Volume (veh/h)	624	180	100	125	0	310	0	2459	160	270	1555	521
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1881	0	1881	0	1827	1900	1881	1845	1881
Adj Flow Rate, veh/h	657	189	105	132	0	326	0	2588	168	284	1637	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	1	0	1	0	4	0	1	3	1
Cap, veh/h	710	347	152	138	0	0	0	2478	637	966	2512	1146
Arrive On Green	0.21	0.10	0.10	0.08	0.00	0.00	0.00	0.39	0.39	0.28	0.72	0.00
Sat Flow, veh/h	3442	3610	1583	1792	132		0	6540	1615	3476	3505	1599
Grp Volume(v), veh/h	657	189	105	132	126.6		0	2588	168	284	1637	0
Grp Sat Flow(s),veh/h/ln	1721	1805	1583	1792	F		0	1571	1615	1738	1752	1599
Q Serve(g_s), s	26.2	7.0	9.0	10.3			0.0	55.2	7.3	9.0	34.8	0.0
Cycle Q Clear(g_c), s	26.2	7.0	9.0	10.3			0.0	55.2	7.3	9.0	34.8	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	710	347	152	138			0	2478	637	966	2512	1146
V/C Ratio(X)	0.93	0.54	0.69	0.96			0.00	1.04	0.26	0.29	0.65	0.00
Avail Cap(c_a), veh/h	762	1083	475	138			0	2478	637	966	2512	1146
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.76	0.76	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.5	60.3	61.2	64.4			0.0	42.4	15.9	39.7	10.5	0.0
Incr Delay (d2), s/veh	16.3	0.5	2.1	62.3			0.0	29.0	0.8	0.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.1	3.5	4.0	7.5			0.0	28.9	3.4	4.3	17.1	0.0
LnGrp Delay(d),s/veh	70.8	60.8	63.3	126.6			0.0	71.4	16.7	39.8	11.9	0.0
LnGrp LOS	E	E	E	F				F	B	D	B	
Approach Vol, veh/h		951						2756			1921	
Approach Delay, s/veh		68.0						68.1			16.0	
Approach LOS		E						E			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	45.1	61.4	15.4	18.1		106.5	33.5	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	12.0	* 55	10.8	42.0		71.8	31.0	
Max Q Clear Time (g_c+I1), s	11.0	57.2	12.3	11.0		36.8	28.2	
Green Ext Time (p_c), s	0.1	0.0	0.0	0.5		6.5	0.7	

Intersection Summary	
HCM 2010 Ctrl Delay	52.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	10	65	25	5	75	55	2389	65	0	1590	190
Future Volume (veh/h)	155	10	65	25	5	75	55	2389	65	0	1590	190
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1894	1881	1863	1863	1900	0	1863	1863
Adj Flow Rate, veh/h	168	11	71	27	5	82	60	2597	71	0	1728	207
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	1	2	2	2	0	2	2
Cap, veh/h	204	25	161	105	19	110	77	4483	122	0	2157	965
Arrive On Green	0.11	0.11	0.11	0.07	0.07	0.07	0.04	0.69	0.69	0.00	0.61	0.61
Sat Flow, veh/h	1774	217	1399	1533	284	1599	1774	6461	176	0	3632	1583
Grp Volume(v), veh/h	168	0	82	32	0	82	60	1931	737	0	1728	207
Grp Sat Flow(s),veh/h/ln	1774	0	1616	1817	0	1599	1774	1602	1831	0	1770	1583
Q Serve(g_s), s	10.2	0.0	5.2	1.8	0.0	5.5	3.7	22.6	22.7	0.0	41.0	6.5
Cycle Q Clear(g_c), s	10.2	0.0	5.2	1.8	0.0	5.5	3.7	22.6	22.7	0.0	41.0	6.5
Prop In Lane	1.00		0.87	0.84		1.00	1.00		0.10	0.00		1.00
Lane Grp Cap(c), veh/h	204	0	186	125	0	110	77	3335	1271	0	2157	965
V/C Ratio(X)	0.82	0.00	0.44	0.26	0.00	0.75	0.78	0.58	0.58	0.00	0.80	0.21
Avail Cap(c_a), veh/h	290	0	264	297	0	262	81	3335	1271	0	2157	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.00	0.70	0.70
Uniform Delay (d), s/veh	47.6	0.0	45.4	48.6	0.0	50.3	52.1	8.6	8.6	0.0	16.4	9.6
Incr Delay (d2), s/veh	12.2	0.0	1.6	1.1	0.0	9.7	4.3	0.1	0.2	0.0	2.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	2.4	1.0	0.0	2.7	1.9	9.9	11.3	0.0	20.6	2.9
LnGrp Delay(d),s/veh	59.8	0.0	47.0	49.7	0.0	60.0	56.4	8.7	8.8	0.0	18.7	10.0
LnGrp LOS	E		D	D		E	E	A	A		B	B
Approach Vol, veh/h		250			114			2728			1935	
Approach Delay, s/veh		55.6			57.1			9.8			17.7	
Approach LOS		E			E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		80.8		17.1	9.3	71.6		12.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		60.5		18.0	5.0	51.0		18.0
Max Q Clear Time (g_c+I1), s		24.7		12.2	5.7	43.0		7.5
Green Ext Time (p_c), s		35.1		0.5	0.0	8.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	55	485	155	100	15	295	2289	185	100	1475	105
Future Volume (veh/h)	205	55	485	155	100	15	295	2289	185	100	1475	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1776	1900	1900	1900	1863	1863	1696	1881	1900
Adj Flow Rate, veh/h	223	60	527	168	109	16	321	2488	201	109	1603	114
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	7	0	0	0	2	2	12	1	0
Cap, veh/h	187	522	444	203	443	377	271	2360	734	109	1363	615
Arrive On Green	0.10	0.27	0.27	0.06	0.23	0.23	0.15	0.46	0.46	0.07	0.38	0.38
Sat Flow, veh/h	1810	1900	1615	3281	1900	1615	1810	5085	1582	1616	3574	1614
Grp Volume(v), veh/h	223	60	527	168	109	16	321	2488	201	109	1603	114
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1640	1900	1615	1810	1695	1582	1616	1787	1614
Q Serve(g_s), s	15.5	3.5	41.2	7.6	7.0	1.2	22.5	69.6	11.7	10.1	57.2	7.1
Cycle Q Clear(g_c), s	15.5	3.5	41.2	7.6	7.0	1.2	22.5	69.6	11.7	10.1	57.2	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	187	522	444	203	443	377	271	2360	734	109	1363	615
V/C Ratio(X)	1.19	0.11	1.19	0.83	0.25	0.04	1.18	1.05	0.27	1.00	1.18	0.19
Avail Cap(c_a), veh/h	187	522	444	203	443	377	271	2360	734	109	1363	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.3	40.7	54.4	69.5	46.8	44.5	63.7	40.2	24.7	69.9	46.4	30.9
Incr Delay (d2), s/veh	127.3	0.1	105.2	23.5	0.3	0.1	113.3	34.9	0.2	86.8	87.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	1.9	31.3	4.1	3.7	0.5	19.8	40.2	5.2	7.1	44.7	3.2
LnGrp Delay(d),s/veh	194.5	40.9	159.6	93.0	47.1	44.6	177.1	75.1	24.9	156.8	133.7	31.1
LnGrp LOS	F	D	F	F	D	D	F	F	C	F	F	C
Approach Vol, veh/h		810			293			3010			1826	
Approach Delay, s/veh		160.4			73.3			82.6			128.6	
Approach LOS		F			E			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	75.4	13.8	46.2	27.0	63.0	20.0	40.0
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	10.1	69.6	9.3	41.2	22.5	57.2	15.5	35.0
Max Q Clear Time (g_c+I1), s	12.1	71.6	9.6	43.2	24.5	59.2	17.5	9.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	106.9
HCM 2010 LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	285	175	60	2464	1975	175
Future Volume (veh/h)	285	175	60	2464	1975	175
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1863	1866	1900
Adj Flow Rate, veh/h	300	184	63	2594	2079	184
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	2	2	2
Cap, veh/h	500	230	82	2645	3116	273
Arrive On Green	0.14	0.14	0.05	0.75	0.65	0.65
Sat Flow, veh/h	3510	1615	1810	3632	4937	418
Grp Volume(v), veh/h	300	184	63	2594	1475	788
Grp Sat Flow(s),veh/h/ln	1755	1615	1810	1770	1698	1792
Q Serve(g_s), s	7.4	10.2	3.2	64.2	24.6	25.2
Cycle Q Clear(g_c), s	7.4	10.2	3.2	64.2	24.6	25.2
Prop In Lane	1.00	1.00	1.00			0.23
Lane Grp Cap(c), veh/h	500	230	82	2645	2219	1171
V/C Ratio(X)	0.60	0.80	0.77	0.98	0.66	0.67
Avail Cap(c_a), veh/h	701	323	176	2726	2219	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	38.4	43.7	11.1	9.8	9.9
Incr Delay (d2), s/veh	1.2	9.2	14.0	12.9	0.8	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.2	1.9	35.0	11.5	12.8
LnGrp Delay(d),s/veh	38.4	47.7	57.7	24.0	10.6	11.5
LnGrp LOS	D	D	E	C	B	B
Approach Vol, veh/h	484			2657	2263	
Approach Delay, s/veh	41.9			24.8	10.9	
Approach LOS	D			C	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		17.7	8.7	66.2				74.9
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	9.0	57.8				71.3
Max Q Clear Time (g_c+I1), s		12.2	5.2	27.2				66.2
Green Ext Time (p_c), s		1.0	0.0	30.5				3.0

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	320	625	105	240	214	485	1974	110	329	1620	231
Future Volume (veh/h)	336	320	625	105	240	214	485	1974	110	329	1620	231
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1845	1900	1900	1810	1900	1863	1863	1900	1863	1863	1845
Adj Flow Rate, veh/h	361	344	672	113	258	230	522	2123	118	354	1742	248
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	0	0	5	5	2	2	2	2	2	3
Cap, veh/h	259	846	385	112	275	234	573	1458	80	245	2029	613
Arrive On Green	0.14	0.24	0.24	0.06	0.16	0.16	0.17	0.43	0.43	0.14	0.40	0.40
Sat Flow, veh/h	1792	3505	1595	1810	1733	1478	3442	3410	188	1774	5085	1538
Grp Volume(v), veh/h	361	344	672	113	256	232	522	1092	1149	354	1742	248
Grp Sat Flow(s),veh/h/ln	1792	1752	1595	1810	1719	1491	1721	1770	1828	1774	1695	1538
Q Serve(g_s), s	21.0	12.0	35.0	9.0	21.3	22.5	21.6	62.0	62.0	20.0	45.4	16.8
Cycle Q Clear(g_c), s	21.0	12.0	35.0	9.0	21.3	22.5	21.6	62.0	62.0	20.0	45.4	16.8
Prop In Lane	1.00		1.00	1.00		0.99	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	259	846	385	112	273	237	573	757	782	245	2029	613
V/C Ratio(X)	1.39	0.41	1.75	1.01	0.94	0.98	0.91	1.44	1.47	1.45	0.86	0.40
Avail Cap(c_a), veh/h	259	846	385	112	273	237	593	757	782	245	2029	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.0	46.3	55.0	68.0	60.3	60.8	59.4	41.5	41.5	62.5	39.8	31.2
Incr Delay (d2), s/veh	198.0	1.1	346.1	86.6	38.5	53.1	18.9	206.8	218.5	222.5	4.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.7	5.9	52.4	7.2	13.1	12.8	11.8	73.7	78.7	24.9	22.1	7.2
LnGrp Delay(d),s/veh	260.0	47.4	401.1	154.6	98.8	113.9	78.2	248.3	260.0	285.0	43.9	31.8
LnGrp LOS	F	D	F	F	F	F	E	F	F	F	D	C
Approach Vol, veh/h		1377			601			2763			2344	
Approach Delay, s/veh		275.8			115.1			221.0			79.1	
Approach LOS		F			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	67.0	13.0	41.0	28.2	62.8	25.0	29.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	20.0	62.0	9.0	35.0	25.0	57.0	21.0	23.0
Max Q Clear Time (g_c+I1), s	22.0	64.0	11.0	37.0	23.6	47.4	23.0	24.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.6	9.6	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	175.7
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	170	380	130	105	55	155	1050	235	45	531	25
Future Volume (veh/h)	140	170	380	130	105	55	155	1050	235	45	531	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1724	1845	1900	1743	1792	1681	1848	1900	1900	1827	1624
Adj Flow Rate, veh/h	154	187	418	143	115	60	170	1154	258	49	584	27
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	12	12	3	9	9	6	13	3	3	0	4	17
Cap, veh/h	35	0	486	37	0	472	192	821	184	63	870	643
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.12	0.56	0.56	0.03	0.48	0.48
Sat Flow, veh/h	0	0	1565	0	0	1522	1601	1463	327	1810	1827	1350
Grp Volume(v), veh/h	341	0	418	258	0	60	170	0	1412	49	584	27
Grp Sat Flow(s),veh/h/ln	0	0	1565	0	0	1522	1601	0	1790	1810	1827	1350
Q Serve(g_s), s	0.0	0.0	37.6	0.0	0.0	4.2	15.7	0.0	84.1	4.0	36.9	1.6
Cycle Q Clear(g_c), s	46.5	0.0	37.6	46.5	0.0	4.2	15.7	0.0	84.1	4.0	36.9	1.6
Prop In Lane	0.45		1.00	0.55		1.00	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	35	0	486	37	0	472	192	0	1005	63	870	643
V/C Ratio(X)	9.78	0.00	0.86	6.91	0.00	0.13	0.89	0.00	1.41	0.77	0.67	0.04
Avail Cap(c_a), veh/h	35	0	486	37	0	472	273	0	1005	65	870	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	74.9	0.0	48.6	74.9	0.0	37.1	64.9	0.0	32.9	71.7	30.2	21.0
Incr Delay (d2), s/veh	4006.6	0.0	14.7	2714.3	0.0	0.1	22.1	0.0	188.5	43.0	3.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	40.2	0.0	18.3	29.7	0.0	1.8	8.1	0.0	93.9	2.8	19.2	0.6
LnGrp Delay(d),s/veh	4081.5	0.0	63.3	2789.2	0.0	37.2	87.0	0.0	221.4	114.7	33.2	21.0
LnGrp LOS	F		E	F		D	F		F	F	C	C
Approach Vol, veh/h		759			318			1582			660	
Approach Delay, s/veh		1868.6			2270.0			206.9			38.8	
Approach LOS		F			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	89.5		51.0	22.1	76.8		51.0
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.4	84.1		46.5	25.5	64.0		46.5
Max Q Clear Time (g_c+I1), s	6.0	86.1		48.5	17.7	38.9		48.5
Green Ext Time (p_c), s	0.0	0.0		0.0	0.3	24.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	751.2
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	240	50	836	145	295	50	775	846	190	836	41
Future Volume (veh/h)	70	240	50	836	145	295	50	775	846	190	836	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1839	1900	1881	1870	1900	1900	1845	1881	1900	1860	1900
Adj Flow Rate, veh/h	74	255	53	999	0	314	53	824	900	202	889	44
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	1	3	0	0	3	1	0	2	2
Cap, veh/h	212	351	72	1019	0	457	69	1262	575	182	1448	72
Arrive On Green	0.12	0.12	0.12	0.28	0.00	0.28	0.04	0.36	0.36	0.10	0.42	0.42
Sat Flow, veh/h	1740	2884	589	3583	0	1606	1810	3505	1596	1810	3423	169
Grp Volume(v), veh/h	74	153	155	999	0	314	53	824	900	202	459	474
Grp Sat Flow(s),veh/h/ln	1740	1747	1726	1792	0	1606	1810	1752	1596	1810	1767	1826
Q Serve(g_s), s	5.4	11.7	12.1	38.4	0.0	24.1	4.0	27.3	50.0	14.0	28.1	28.1
Cycle Q Clear(g_c), s	5.4	11.7	12.1	38.4	0.0	24.1	4.0	27.3	50.0	14.0	28.1	28.1
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	212	212	210	1019	0	457	69	1262	575	182	747	772
V/C Ratio(X)	0.35	0.72	0.74	0.98	0.00	0.69	0.77	0.65	1.57	1.11	0.61	0.61
Avail Cap(c_a), veh/h	351	352	348	1019	0	457	117	1262	575	182	747	772
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.0	58.7	58.9	49.3	0.0	44.2	66.2	37.2	44.4	62.4	31.2	31.2
Incr Delay (d2), s/veh	1.0	4.5	5.1	23.4	0.0	4.3	16.5	1.4	263.1	98.3	1.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.9	6.1	22.3	0.0	11.2	2.3	13.4	63.9	11.9	14.0	14.5
LnGrp Delay(d),s/veh	57.0	63.2	63.9	72.7	0.0	48.5	82.8	38.6	307.5	160.8	33.0	33.0
LnGrp LOS	E	E	E	E		D	F	D	F	F	C	C
Approach Vol, veh/h		382			1313			1777			1135	
Approach Delay, s/veh		62.3			66.9			176.1			55.7	
Approach LOS		E			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	55.0		21.9	9.3	63.7		44.0
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	14.0	50.0		28.0	9.0	55.0		39.5
Max Q Clear Time (g_c+I1), s	16.0	52.0		14.1	6.0	30.1		40.4
Green Ext Time (p_c), s	0.0	0.0		1.7	0.0	21.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	105.9
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	329	1140	25	35	1095	515	55	20	15	490	20	259
Future Volume (veh/h)	329	1140	25	35	1095	515	55	20	15	490	20	259
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1882	1900	1845	1881	1776	1900	1900	1900	1863	1866	1900
Adj Flow Rate, veh/h	343	1188	26	36	1141	0	57	21	16	525	0	270
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	3	1	7	0	0	0	2	0	0
Cap, veh/h	348	1738	38	45	1140	481	130	71	54	789	0	357
Arrive On Green	0.19	0.49	0.49	0.03	0.32	0.00	0.07	0.07	0.07	0.22	0.00	0.22
Sat Flow, veh/h	1810	3577	78	1757	3574	1509	1810	994	757	3548	0	1606
Grp Volume(v), veh/h	343	594	620	36	1141	0	57	0	37	525	0	270
Grp Sat Flow(s),veh/h/ln	1810	1788	1867	1757	1787	1509	1810	0	1751	1774	0	1606
Q Serve(g_s), s	18.9	25.6	25.7	2.0	32.0	0.0	3.0	0.0	2.0	13.5	0.0	15.8
Cycle Q Clear(g_c), s	18.9	25.6	25.7	2.0	32.0	0.0	3.0	0.0	2.0	13.5	0.0	15.8
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.43	1.00		1.00
Lane Grp Cap(c), veh/h	348	868	907	45	1140	481	130	0	126	789	0	357
V/C Ratio(X)	0.99	0.68	0.68	0.80	1.00	0.00	0.44	0.00	0.29	0.67	0.00	0.76
Avail Cap(c_a), veh/h	348	868	907	89	1140	481	130	0	126	1132	0	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.4	19.9	19.9	48.6	34.2	0.0	44.6	0.0	44.1	35.6	0.0	36.5
Incr Delay (d2), s/veh	44.1	3.8	3.6	26.9	26.8	0.0	10.4	0.0	5.9	1.4	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.7	13.4	14.0	1.3	19.9	0.0	1.9	0.0	1.2	6.8	0.0	7.5
LnGrp Delay(d),s/veh	84.5	23.6	23.5	75.5	61.0	0.0	55.0	0.0	50.0	37.0	0.0	41.6
LnGrp LOS	F	C	C	E	F		E		D	D		D
Approach Vol, veh/h		1557			1177			94			795	
Approach Delay, s/veh		37.0			61.4			53.1			38.5	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.2	7.1	53.7		27.3	23.8	37.0
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.2	5.1	46.2		32.0	19.3	32.0
Max Q Clear Time (g_c+I1), s		5.0	4.0	27.7		17.8	20.9	34.0
Green Ext Time (p_c), s		0.1	0.0	18.1		4.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1125	535	640	1355	0	0	0	0	70	5	330
Future Volume (veh/h)	0	1125	535	640	1355	0	0	0	0	70	5	330
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1881	1863	1863	1827	0				1900	1863	1900
Adj Flow Rate, veh/h	0	1184	563	674	1426	0				74	5	347
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	2	4	0				0	0	0
Cap, veh/h	0	1223	540	677	2650	0				309	4	267
Arrive On Green	0.00	0.34	0.34	0.38	0.76	0.00				0.17	0.17	0.17
Sat Flow, veh/h	0	3668	1579	1774	3563	0				1810	23	1565
Grp Volume(v), veh/h	0	1184	563	674	1426	0				74	0	352
Grp Sat Flow(s),veh/h/ln	0	1787	1579	1774	1736	0				1810	0	1587
Q Serve(g_s), s	0.0	45.6	47.9	53.1	23.1	0.0				5.0	0.0	23.9
Cycle Q Clear(g_c), s	0.0	45.6	47.9	53.1	23.1	0.0				5.0	0.0	23.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1223	540	677	2650	0				309	0	271
V/C Ratio(X)	0.00	0.97	1.04	1.00	0.54	0.00				0.24	0.00	1.30
Avail Cap(c_a), veh/h	0	1223	540	677	2650	0				309	0	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.67	0.67	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	45.3	46.0	43.2	6.6	0.0				50.2	0.0	58.1
Incr Delay (d2), s/veh	0.0	14.8	43.2	9.5	0.1	0.0				0.1	0.0	159.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.0	27.3	27.8	10.9	0.0				2.5	0.0	22.4
LnGrp Delay(d),s/veh	0.0	60.1	89.2	52.7	6.7	0.0				50.3	0.0	217.1
LnGrp LOS		E	F	D	A					D		F
Approach Vol, veh/h		1747			2100						426	
Approach Delay, s/veh		69.5			21.5						188.1	
Approach LOS		E			C						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	59.0	53.0		28.0		112.0		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	53.4	47.9		23.9		106.9		
Max Q Clear Time (g_c+I1), s	55.1	49.9		25.9		25.1		
Green Ext Time (p_c), s	0.0	0.0		0.0		34.7		

Intersection Summary	
HCM 2010 Ctrl Delay	57.7
HCM 2010 LOS	E

HCM 2010 Signalized Intersection Summary
19: I-80 EB Ramps & Rocklin Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	885	0	0	1550	135	445	5	570	0	0	0
Future Volume (veh/h)	310	885	0	0	1550	135	445	5	570	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1810	1848	1863			
Adj Flow Rate, veh/h	337	962	0	0	1685	147	700	0	392			
Adj No. of Lanes	1	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	1	0	0	1	1	5	0	2			
Cap, veh/h	328	2445	0	0	1658	742	789	0	363			
Arrive On Green	0.19	0.68	0.00	0.00	0.46	0.46	0.23	0.00	0.23			
Sat Flow, veh/h	1774	3668	0	0	3668	1599	3447	0	1583			
Grp Volume(v), veh/h	337	962	0	0	1685	147	700	0	392			
Grp Sat Flow(s),veh/h/ln	1774	1787	0	0	1787	1599	1723	0	1583			
Q Serve(g_s), s	18.5	11.6	0.0	0.0	46.4	5.4	19.6	0.0	22.9			
Cycle Q Clear(g_c), s	18.5	11.6	0.0	0.0	46.4	5.4	19.6	0.0	22.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	328	2445	0	0	1658	742	789	0	363			
V/C Ratio(X)	1.03	0.39	0.00	0.00	1.02	0.20	0.89	0.00	1.08			
Avail Cap(c_a), veh/h	328	2445	0	0	1658	742	789	0	363			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.26	0.26	0.00	0.00	0.66	0.66	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.8	6.8	0.0	0.0	26.8	15.8	37.3	0.0	38.5			
Incr Delay (d2), s/veh	32.4	0.1	0.0	0.0	22.1	0.4	12.2	0.0	70.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.0	5.7	0.0	0.0	27.9	2.4	10.7	0.0	17.1			
LnGrp Delay(d),s/veh	73.1	7.0	0.0	0.0	48.9	16.2	49.5	0.0	109.2			
LnGrp LOS	F	A			F	B	D		F			
Approach Vol, veh/h		1299			1832			1092				
Approach Delay, s/veh		24.1			46.2			70.9				
Approach LOS		C			D			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		73.0			22.0	51.0		27.0
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		68.4			18.5	46.4		22.9
Max Q Clear Time (g_c+I1), s		13.6			20.5	48.4		24.9
Green Ext Time (p_c), s		27.5			0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1060	340	57	1440	0	250	0	57	0	0	0
Future Volume (veh/h)	55	1060	340	57	1440	0	250	0	57	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1858	1900	1900	1863	0	1827	0	1810			
Adj Flow Rate, veh/h	60	1165	374	63	1582	0	275	0	63			
Adj No. of Lanes	1	3	0	1	3	0	1	0	1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	2	2	0	2	0	4	0	5			
Cap, veh/h	127	1683	540	87	2154	0	362	0	320			
Arrive On Green	0.07	0.45	0.45	0.05	0.42	0.00	0.21	0.00	0.21			
Sat Flow, veh/h	1810	3777	1212	1810	5253	0	1740	0	1538			
Grp Volume(v), veh/h	60	1043	496	63	1582	0	275	0	63			
Grp Sat Flow(s),veh/h/ln	1810	1691	1607	1810	1695	0	1740	0	1538			
Q Serve(g_s), s	1.4	11.2	11.2	1.6	11.8	0.0	6.7	0.0	1.5			
Cycle Q Clear(g_c), s	1.4	11.2	11.2	1.6	11.8	0.0	6.7	0.0	1.5			
Prop In Lane	1.00		0.75	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	127	1507	716	87	2154	0	362	0	320			
V/C Ratio(X)	0.47	0.69	0.69	0.72	0.73	0.00	0.76	0.00	0.20			
Avail Cap(c_a), veh/h	240	1507	716	224	2188	0	806	0	713			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.3	10.1	10.1	21.3	10.9	0.0	16.9	0.0	14.8			
Incr Delay (d2), s/veh	2.7	2.0	4.1	10.6	1.8	0.0	3.3	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	5.5	5.6	1.0	5.8	0.0	3.5	0.0	0.7			
LnGrp Delay(d),s/veh	23.0	12.1	14.2	31.8	12.7	0.0	20.2	0.0	15.1			
LnGrp LOS	C	B	B	C	B		C		B			
Approach Vol, veh/h		1599			1645			338				
Approach Delay, s/veh		13.1			13.4			19.2				
Approach LOS		B			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	6.2	25.2			7.2	24.2		13.9
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	19.9			6.0	19.5		21.0
Max Q Clear Time (g_c+I1), s	3.6	13.2			3.4	13.8		8.7
Green Ext Time (p_c), s	0.0	6.7			0.0	5.4		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	2482	1921	5
Future Vol, veh/h	0	20	5	2482	1921	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	2559	1980	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	993	1985	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.2	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.95	3.1	-	-	-
Pot Cap-1 Maneuver	0	205	130	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	205	130	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.5	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	130	-	205	-	-
HCM Lane V/C Ratio	0.04	-	0.101	-	-
HCM Control Delay (s)	33.8	-	24.5	-	-
HCM Lane LOS	D	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	325	125	165	200	100	50	524	305	175	284	100
Future Volume (veh/h)	70	325	125	165	200	100	50	524	305	175	284	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	76	353	136	179	217	109	54	570	332	190	309	109
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	351	135	206	392	197	77	569	331	215	881	305
Arrive On Green	0.05	0.27	0.27	0.12	0.34	0.34	0.04	0.26	0.26	0.12	0.34	0.34
Sat Flow, veh/h	1774	1282	494	1774	1171	588	1774	2156	1255	1774	2581	893
Grp Volume(v), veh/h	76	0	489	179	0	326	54	468	434	190	210	208
Grp Sat Flow(s),veh/h/ln	1774	0	1776	1774	0	1759	1774	1770	1641	1774	1770	1705
Q Serve(g_s), s	3.4	0.0	21.9	7.9	0.0	12.1	2.4	21.1	21.1	8.4	7.1	7.3
Cycle Q Clear(g_c), s	3.4	0.0	21.9	7.9	0.0	12.1	2.4	21.1	21.1	8.4	7.1	7.3
Prop In Lane	1.00		0.28	1.00		0.33	1.00		0.76	1.00		0.52
Lane Grp Cap(c), veh/h	98	0	486	206	0	589	77	467	433	215	604	582
V/C Ratio(X)	0.78	0.00	1.01	0.87	0.00	0.55	0.70	1.00	1.00	0.88	0.35	0.36
Avail Cap(c_a), veh/h	140	0	486	206	0	589	149	467	433	215	604	582
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.57	0.00	0.57	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	29.1	34.7	0.0	21.7	37.7	29.5	29.5	34.6	19.7	19.8
Incr Delay (d2), s/veh	16.0	0.0	42.3	19.4	0.0	0.6	10.7	42.2	44.0	32.1	1.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	16.4	5.0	0.0	6.0	1.4	15.7	14.8	6.0	3.7	3.7
LnGrp Delay(d),s/veh	53.3	0.0	71.4	54.1	0.0	22.4	48.4	71.7	73.5	66.7	21.3	21.5
LnGrp LOS	D		F	D		C	D	F	F	E	C	C
Approach Vol, veh/h		565			505			956			608	
Approach Delay, s/veh		69.0			33.6			71.2			35.5	
Approach LOS		E			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	25.6	13.8	26.4	8.0	31.8	8.9	31.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	21.1	9.3	21.9	6.7	24.1	6.3	24.9
Max Q Clear Time (g_c+I1), s	10.4	23.1	9.9	23.9	4.4	9.3	5.4	14.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	7.5	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	55.3
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	817	130	29	1012	50	120	5	39	95	10	355
Future Volume (veh/h)	170	817	130	29	1012	50	120	5	39	95	10	355
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	185	888	141	32	1100	54	130	5	42	103	215	250
Adj No. of Lanes	1	3	0	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	210	1635	258	176	1822	89	192	19	156	70	147	188
Arrive On Green	0.12	0.37	0.37	0.10	0.37	0.37	0.11	0.11	0.11	0.12	0.12	0.12
Sat Flow, veh/h	1774	4429	700	1774	4966	244	1774	171	1438	594	1239	1583
Grp Volume(v), veh/h	185	679	350	32	751	403	130	0	47	318	0	250
Grp Sat Flow(s),veh/h/ln	1774	1695	1739	1774	1695	1820	1774	0	1609	1833	0	1583
Q Serve(g_s), s	6.1	9.3	9.4	1.0	10.6	10.6	4.2	0.0	1.6	7.0	0.0	7.0
Cycle Q Clear(g_c), s	6.1	9.3	9.4	1.0	10.6	10.6	4.2	0.0	1.6	7.0	0.0	7.0
Prop In Lane	1.00		0.40	1.00		0.13	1.00		0.89	0.32		1.00
Lane Grp Cap(c), veh/h	210	1252	642	176	1244	668	192	0	174	217	0	188
V/C Ratio(X)	0.88	0.54	0.55	0.18	0.60	0.60	0.68	0.00	0.27	1.46	0.00	1.33
Avail Cap(c_a), veh/h	210	1493	766	176	1378	740	901	0	817	217	0	188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.6	14.7	14.7	24.4	15.2	15.2	25.3	0.0	24.2	26.0	0.0	26.0
Incr Delay (d2), s/veh	32.0	1.3	2.6	0.5	1.8	3.3	4.1	0.0	0.8	232.1	0.0	181.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.6	4.9	0.5	5.2	5.9	2.2	0.0	0.7	17.5	0.0	12.5
LnGrp Delay(d),s/veh	57.6	16.0	17.3	24.9	17.0	18.5	29.5	0.0	25.0	258.2	0.0	207.2
LnGrp LOS	E	B	B	C	B	B	C		C	F		F
Approach Vol, veh/h		1214			1186			177			568	
Approach Delay, s/veh		22.7			17.7			28.3			235.7	
Approach LOS		C			B			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.9	26.8		10.4	11.0	26.7		11.0
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 26		30.0	7.0	24.0		7.0
Max Q Clear Time (g_c+I1), s	3.0	11.4		6.2	8.1	12.6		9.0
Green Ext Time (p_c), s	1.8	10.4		0.6	0.0	9.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	59.6
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	0	83	402	0	161	48	2227	387	142	1739	60
Future Volume (veh/h)	105	0	83	402	0	161	48	2227	387	142	1739	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	114	0	90	437	0	175	52	2421	421	154	1890	65
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	142	0	132	480	0	226	67	2633	1040	174	2918	100
Arrive On Green	0.08	0.00	0.08	0.14	0.00	0.14	0.04	0.52	0.52	0.10	0.58	0.58
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5049	173
Grp Volume(v), veh/h	114	0	90	437	0	175	52	2421	421	154	1268	687
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1832
Q Serve(g_s), s	7.0	0.0	6.1	13.9	0.0	11.9	3.2	48.7	13.8	9.5	28.1	28.1
Cycle Q Clear(g_c), s	7.0	0.0	6.1	13.9	0.0	11.9	3.2	48.7	13.8	9.5	28.1	28.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	142	0	132	480	0	226	67	2633	1040	174	1959	1059
V/C Ratio(X)	0.80	0.00	0.68	0.91	0.00	0.78	0.78	0.92	0.40	0.89	0.65	0.65
Avail Cap(c_a), veh/h	242	0	256	480	0	260	145	2633	1040	174	1959	1059
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.3	0.0	49.6	47.2	0.0	46.0	53.1	24.7	8.9	49.6	15.8	15.8
Incr Delay (d2), s/veh	10.2	0.0	6.1	21.6	0.0	11.9	17.2	6.6	1.2	38.0	1.7	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	2.9	8.1	0.0	5.9	1.9	24.3	6.3	6.5	13.5	15.0
LnGrp Delay(d),s/veh	60.5	0.0	55.7	68.8	0.0	57.9	70.2	31.3	10.1	87.5	17.5	18.9
LnGrp LOS	E		E	E		E	E	C	B	F	B	B
Approach Vol, veh/h		204			612			2894			2109	
Approach Delay, s/veh		58.4			65.7			28.9			23.1	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	62.1	20.0	13.7	8.7	68.8	13.4	20.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.9	57.6	15.5	18.0	9.1	59.4	15.2	18.3
Max Q Clear Time (g_c+I1), s	11.5	50.7	15.9	8.1	5.2	30.1	9.0	13.9
Green Ext Time (p_c), s	0.0	6.8	0.0	1.1	0.0	28.9	0.1	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	690	7	0	233	0	3
Future Vol, veh/h	690	7	0	233	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	750	8	0	253	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	754
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	409
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	409
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	409	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	13.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	480	638	194	365	0	1233	0	354	0	0	0
Future Volume (veh/h)	5	480	638	194	365	0	1233	0	354	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1776	1845	1776	1792	1900	1810	1827	1900	1900	1900	1900
Adj Flow Rate, veh/h	5	500	0	202	380	0	1284	0	369	0	0	0
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	7	3	7	6	6	5	0	0	0	0	0
Cap, veh/h	11	423	374	162	588	0	981	0	884	1	1	0
Arrive On Green	0.01	0.24	0.00	0.10	0.33	0.00	0.57	0.00	0.57	0.00	0.00	0.00
Sat Flow, veh/h	1810	1776	1568	1691	1792	0	1723	0	1553	1810	1900	0
Grp Volume(v), veh/h	5	500	0	202	380	0	1284	0	369	0	0	0
Grp Sat Flow(s),veh/h/ln	1810	1776	1568	1691	1792	0	1723	0	1553	1810	1900	0
Q Serve(g_s), s	0.4	33.5	0.0	13.5	25.4	0.0	80.0	0.0	18.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	33.5	0.0	13.5	25.4	0.0	80.0	0.0	18.9	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	11	423	374	162	588	0	981	0	884	1	1	0
V/C Ratio(X)	0.44	1.18	0.00	1.24	0.65	0.00	1.31	0.00	0.42	0.00	0.00	0.00
Avail Cap(c_a), veh/h	64	423	374	162	588	0	981	0	884	64	68	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	69.6	53.5	0.0	63.5	40.2	0.0	30.2	0.0	17.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	24.2	103.3	0.0	150.6	2.4	0.0	146.2	0.0	0.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	28.5	0.0	13.1	13.0	0.0	77.7	0.0	8.2	0.0	0.0	0.0
LnGrp Delay(d),s/veh	93.8	156.8	0.0	214.1	42.7	0.0	176.5	0.0	17.4	0.0	0.0	0.0
LnGrp LOS	F	F		F	D		F		B			
Approach Vol, veh/h		505			582			1653			0	
Approach Delay, s/veh		156.2			102.2			141.0			0.0	
Approach LOS		F			F			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		84.5	18.0	38.0		0.0	5.4	50.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		80.0	13.5	33.5		5.0	5.0	42.0
Max Q Clear Time (g_c+I1), s		82.0	15.5	35.5		0.0	2.4	27.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	135.5
HCM 2010 LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	285	2001	17	240	1035
Future Volume (veh/h)	17	285	2001	17	240	1035
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1863	1900	1863	1810
Adj Flow Rate, veh/h	18	306	2152	18	258	1113
Adj No. of Lanes	0	0	2	0	1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	2	2	2	5
Cap, veh/h	13	218	2161	18	272	2711
Arrive On Green	0.14	0.14	0.60	0.60	0.15	0.79
Sat Flow, veh/h	90	1530	3691	30	1774	3529
Grp Volume(v), veh/h	325	0	1057	1113	258	1113
Grp Sat Flow(s),veh/h/ln	1625	0	1770	1858	1774	1719
Q Serve(g_s), s	18.5	0.0	77.0	77.5	18.7	13.2
Cycle Q Clear(g_c), s	18.5	0.0	77.0	77.5	18.7	13.2
Prop In Lane	0.06	0.94		0.02	1.00	
Lane Grp Cap(c), veh/h	231	0	1063	1116	272	2711
V/C Ratio(X)	1.41	0.00	0.99	1.00	0.95	0.41
Avail Cap(c_a), veh/h	231	0	1063	1116	272	2711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	0.0	25.7	25.8	54.6	4.3
Incr Delay (d2), s/veh	206.1	0.0	26.3	26.3	41.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.5	0.0	45.0	47.4	12.3	6.4
LnGrp Delay(d),s/veh	261.9	0.0	52.0	52.1	95.6	4.8
LnGrp LOS	F		D	D	F	A
Approach Vol, veh/h	325		2170			1371
Approach Delay, s/veh	261.9		52.0			21.9
Approach LOS	F		D			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	24.4	82.6				107.0		23.0
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	19.9	78.1				102.5		18.5
Max Q Clear Time (g_c+I1), s	20.7	79.5				15.2		20.5
Green Ext Time (p_c), s	0.0	0.0				72.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	59.0
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	5	37	5	10	10	1803	382	20	1332	5
Future Vol, veh/h	5	5	5	37	5	10	10	1803	382	20	1332	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	1	0	5	0
Mvmt Flow	5	5	5	40	5	11	11	1960	415	22	1448	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2498	3891	727	2959	3686	1188	1453	0	0	2375	0	0
Stage 1	1494	1494	-	2189	2189	-	-	-	-	-	-	-
Stage 2	1004	2397	-	770	1497	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	15	~ 4	371	~ 7	~ 5	184	472	-	-	207	-	-
Stage 1	131	188	-	48	85	-	-	-	-	-	-	-
Stage 2	263	66	-	364	188	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 3	371	-	~ 4	184	472	-	-	207	-	-
Mov Cap-2 Maneuver	-	~ 3	-	-	~ 4	-	-	-	-	-	-	-
Stage 1	128	168	-	47	83	-	-	-	-	-	-	-
Stage 2	226	64	-	310	168	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	0.4
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	472	-	-	-	371	-	184	207	-	-
HCM Lane V/C Ratio	0.023	-	-	-	0.015	-	0.059	0.105	-	-
HCM Control Delay (s)	12.8	-	-	-	14.8	-	25.8	24.4	-	-
HCM Lane LOS	B	-	-	-	B	-	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-	0.2	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	65	187	50	25	20	117	384	90	15	189	130
Future Volume (veh/h)	285	65	187	50	25	20	117	384	90	15	189	130
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1826	1810	1900	1875	1900	1827	1866	1900	1900	1810	1827
Adj Flow Rate, veh/h	320	73	210	56	28	22	131	431	101	17	212	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	5	5	5	5	4	2	2	0	5	4
Cap, veh/h	372	85	400	75	38	29	167	565	132	36	562	482
Arrive On Green	0.26	0.26	0.26	0.08	0.08	0.08	0.10	0.39	0.39	0.02	0.31	0.00
Sat Flow, veh/h	1428	326	1538	932	466	366	1740	1463	343	1810	1810	1553
Grp Volume(v), veh/h	393	0	210	106	0	0	131	0	532	17	212	0
Grp Sat Flow(s),veh/h/ln	1754	0	1538	1764	0	0	1740	0	1806	1810	1810	1553
Q Serve(g_s), s	15.2	0.0	8.3	4.2	0.0	0.0	5.2	0.0	18.2	0.7	6.5	0.0
Cycle Q Clear(g_c), s	15.2	0.0	8.3	4.2	0.0	0.0	5.2	0.0	18.2	0.7	6.5	0.0
Prop In Lane	0.81		1.00	0.53		0.21	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	456	0	400	142	0	0	167	0	698	36	562	482
V/C Ratio(X)	0.86	0.00	0.52	0.75	0.00	0.00	0.78	0.00	0.76	0.47	0.38	0.00
Avail Cap(c_a), veh/h	530	0	465	446	0	0	320	0	698	127	562	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.1	0.0	22.6	32.0	0.0	0.0	31.5	0.0	19.0	34.5	19.2	0.0
Incr Delay (d2), s/veh	12.2	0.0	1.1	7.6	0.0	0.0	7.8	0.0	7.7	9.1	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	0.0	3.7	2.3	0.0	0.0	2.9	0.0	10.5	0.4	3.5	0.0
LnGrp Delay(d),s/veh	37.3	0.0	23.6	39.6	0.0	0.0	39.3	0.0	26.7	43.6	21.1	0.0
LnGrp LOS	D		C	D			D		C	D	C	
Approach Vol, veh/h		603			106			663			229	
Approach Delay, s/veh		32.5			39.6			29.2			22.8	
Approach LOS		C			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	32.0		23.0	11.3	26.6		10.2
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.0	27.5		21.5	13.1	19.4		18.0
Max Q Clear Time (g_c+I1), s	2.7	20.2		17.2	7.2	8.5		6.2
Green Ext Time (p_c), s	0.0	2.8		1.3	0.1	3.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.2
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	28	533	350	1
Future Vol, veh/h	0	11	28	533	350	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	4	2	3	0
Mvmt Flow	0	13	33	620	407	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1093	408	408	0	-	0
Stage 1	408	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	239	648	1140	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	232	648	1140	-	-	-
Mov Cap-2 Maneuver	232	-	-	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	489	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1140	-	648	-	-
HCM Lane V/C Ratio	0.029	-	0.02	-	-
HCM Control Delay (s)	8.3	-	10.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	160	401	27	260	101
Future Volume (veh/h)	12	160	401	27	260	101
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1852	1900	1874	1900	1810	1881
Adj Flow Rate, veh/h	14	182	456	31	295	115
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	1	1	5	1
Cap, veh/h	18	228	694	47	349	1285
Arrive On Green	0.16	0.16	0.40	0.40	0.20	0.68
Sat Flow, veh/h	113	1467	1735	118	1723	1881
Grp Volume(v), veh/h	197	0	0	487	295	115
Grp Sat Flow(s),veh/h/ln	1588	0	0	1853	1723	1881
Q Serve(g_s), s	6.7	0.0	0.0	11.9	9.2	1.1
Cycle Q Clear(g_c), s	6.7	0.0	0.0	11.9	9.2	1.1
Prop In Lane	0.07	0.92		0.06	1.00	
Lane Grp Cap(c), veh/h	246	0	0	741	349	1285
V/C Ratio(X)	0.80	0.00	0.00	0.66	0.85	0.09
Avail Cap(c_a), veh/h	514	0	0	741	418	1285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	13.6	21.3	3.0
Incr Delay (d2), s/veh	5.9	0.0	0.0	4.5	12.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	6.9	5.6	0.6
LnGrp Delay(d),s/veh	28.6	0.0	0.0	18.1	34.2	3.1
LnGrp LOS	C			B	C	A
Approach Vol, veh/h	197		487			410
Approach Delay, s/veh	28.6		18.1			25.4
Approach LOS	C		B			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	15.8	26.7				42.5		13.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	13.5	20.0				38.0		18.0
Max Q Clear Time (g_c+I1), s	11.2	13.9				3.1		8.7
Green Ext Time (p_c), s	0.2	1.9				4.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	22.8
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	0	353	20	0	201
Future Vol, veh/h	100	0	353	20	0	201
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	106	0	376	21	0	214

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	600	386	0	0	397	0
Stage 1	386	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	467	666	-	-	1173	-
Stage 1	691	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	467	666	-	-	1173	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	826	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	467	-	1173	-
HCM Lane V/C Ratio	-	-	0.228	-	-	-
HCM Control Delay (s)	-	-	15	0	0	-
HCM Lane LOS	-	-	C	A	A	-
HCM 95th %tile Q(veh)	-	-	0.9	-	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	38	0	8	0	365	44	8	243	0
Future Vol, veh/h	0	0	0	38	0	8	0	365	44	8	243	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	3	0	0	0	2	0	0	3	0
Mvmt Flow	0	0	0	42	0	9	0	401	48	9	267	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	715	734	267	710	710	425	267	0	0	449	0	0
Stage 1	285	285	-	425	425	-	-	-	-	-	-	-
Stage 2	430	449	-	285	285	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.13	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.527	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	348	350	777	347	361	634	1308	-	-	1122	-	-
Stage 1	727	679	-	605	590	-	-	-	-	-	-	-
Stage 2	607	576	-	720	679	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	341	347	777	345	358	634	1308	-	-	1122	-	-
Mov Cap-2 Maneuver	341	347	-	345	358	-	-	-	-	-	-	-
Stage 1	727	674	-	605	590	-	-	-	-	-	-	-
Stage 2	599	576	-	714	674	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	16.1	0	0.3
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1308	-	-	-	375	1122	-	-
HCM Lane V/C Ratio	-	-	-	-	0.135	0.008	-	-
HCM Control Delay (s)	0	-	-	0	16.1	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	159	42	367	160	38	243
Future Vol, veh/h	159	42	367	160	38	243
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	181	48	417	182	43	276

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	871	508	0	0	599	0
Stage 1	508	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	324	569	-	-	988	-
Stage 1	608	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	310	569	-	-	988	-
Mov Cap-2 Maneuver	433	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	677	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	433	569	988	-
HCM Lane V/C Ratio	-	-	0.417	0.084	0.044	-
HCM Control Delay (s)	-	-	19.1	11.9	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	31	25	500	354	3
Future Vol, veh/h	3	31	25	500	354	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	3	4	2	3	0
Mvmt Flow	3	35	28	562	398	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1017	399	401	0	-	0
Stage 1	399	-	-	-	-	-
Stage 2	618	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	266	649	1147	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	260	649	1147	-	-	-
Mov Cap-2 Maneuver	387	-	-	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	529	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1147	-	612	-	-
HCM Lane V/C Ratio	0.024	-	0.062	-	-
HCM Control Delay (s)	8.2	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	119	0	0	10	174	1115	0	0	860	25
Future Vol, veh/h	0	0	119	0	0	10	174	1115	0	0	860	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	0	0	7	4	3	0	33	1	0
Mvmt Flow	0	0	125	0	0	11	183	1174	0	0	905	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	905	2445	2445	1174	905	0	0	1174	0	0
Stage 1	-	-	-	1540	1540	-	-	-	-	-	-	-
Stage 2	-	-	-	905	905	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.21	7.1	6.5	6.27	4.14	-	-	4.43	-	-
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.309	3.5	4	3.363	2.236	-	-	2.497	-	-
Pot Cap-1 Maneuver	0	0	336	22	32	228	743	-	-	497	-	-
Stage 1	0	0	-	146	179	-	-	-	-	-	-	-
Stage 2	0	0	-	334	358	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	336	11	24	228	743	-	-	497	-	-
Mov Cap-2 Maneuver	-	-	-	11	24	-	-	-	-	-	-	-
Stage 1	-	-	-	110	135	-	-	-	-	-	-	-
Stage 2	-	-	-	209	358	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.9	21.6	1.5	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	743	-	-	336	228	497	-	-
HCM Lane V/C Ratio	0.247	-	-	0.373	0.046	-	-	-
HCM Control Delay (s)	11.4	-	-	21.9	21.6	0	-	-
HCM Lane LOS	B	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	1	-	-	1.7	0.1	0	-	-

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	693	5	11	230	6	6
Future Vol, veh/h	693	5	11	230	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	753	5	12	250	7	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	759	0	1030	756
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	852	-	259	408
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	852	-	255	408
Mov Cap-2 Maneuver	-	-	-	-	368	-
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	761	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	387	-	-	852	-
HCM Lane V/C Ratio	0.034	-	-	0.014	-
HCM Control Delay (s)	14.6	-	-	9.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 2010 Signalized Intersection Summary
1: Taylor Rd & King Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	85	292	123	40	20	271	354	258	30	215	30
Future Volume (veh/h)	75	85	292	123	40	20	271	354	258	30	215	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1667	1827	1881	1810	1900	1863	1863	1845	1900	1854	1900
Adj Flow Rate, veh/h	93	105	360	152	49	25	335	437	319	37	265	37
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	8	14	4	1	5	5	2	2	3	0	2	2
Cap, veh/h	456	454	414	237	149	76	358	638	528	46	492	68
Arrive On Green	0.27	0.27	0.27	0.13	0.13	0.13	0.20	0.34	0.34	0.03	0.16	0.16
Sat Flow, veh/h	1675	1667	1520	1792	1123	573	1774	1863	1543	1810	3086	424
Grp Volume(v), veh/h	93	105	360	152	0	74	335	437	319	37	149	153
Grp Sat Flow(s),veh/h/ln	1675	1667	1520	1792	0	1696	1774	1863	1543	1810	1761	1749
Q Serve(g_s), s	3.3	3.8	17.4	6.2	0.0	3.0	14.3	15.5	13.2	1.6	6.0	6.2
Cycle Q Clear(g_c), s	3.3	3.8	17.4	6.2	0.0	3.0	14.3	15.5	13.2	1.6	6.0	6.2
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	456	454	414	237	0	224	358	638	528	46	281	279
V/C Ratio(X)	0.20	0.23	0.87	0.64	0.00	0.33	0.94	0.69	0.60	0.81	0.53	0.55
Avail Cap(c_a), veh/h	611	608	554	653	0	618	358	788	653	94	470	467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	21.7	26.7	31.6	0.0	30.2	30.2	21.7	20.9	37.2	29.7	29.7
Incr Delay (d2), s/veh	0.1	0.1	9.0	1.1	0.0	0.3	31.5	1.1	0.4	11.6	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.7	8.3	3.1	0.0	1.4	10.1	8.1	5.6	0.9	3.0	3.0
LnGrp Delay(d),s/veh	21.6	21.8	35.6	32.7	0.0	30.6	61.7	22.8	21.4	48.9	30.2	30.4
LnGrp LOS	C	C	D	C		C	E	C	C	D	C	C
Approach Vol, veh/h		558			226			1091			339	
Approach Delay, s/veh		30.7			32.0			34.3			32.3	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.9	31.8		24.9	20.0	17.7		14.2
Change Period (Y+Rc), s	4.0	5.5		4.0	4.5	5.5		4.0
Max Green Setting (Gmax), s	4.0	32.5		28.0	15.5	20.5		28.0
Max Q Clear Time (g_c+I1), s	3.6	17.5		19.4	16.3	8.2		8.2
Green Ext Time (p_c), s	0.0	3.3		0.9	0.0	3.1		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	15	10	80	20	275	20	596	120	405	508	10
Future Volume (veh/h)	10	15	10	80	20	275	20	596	120	405	508	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1845	1900	1881	1845	1863	1846	1900
Adj Flow Rate, veh/h	11	17	11	91	23	312	23	677	136	460	577	11
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	3	0	1	3	2	3	3
Cap, veh/h	105	147	77	285	64	712	27	748	617	499	1198	23
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.02	0.40	0.40	0.28	0.66	0.66
Sat Flow, veh/h	275	848	441	1182	367	1559	1810	1881	1552	1774	1804	34
Grp Volume(v), veh/h	39	0	0	114	0	312	23	677	136	460	0	588
Grp Sat Flow(s),veh/h/ln	1564	0	0	1549	0	1559	1810	1881	1552	1774	0	1838
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	11.1	1.0	27.6	4.7	20.5	0.0	12.9
Cycle Q Clear(g_c), s	4.9	0.0	0.0	4.9	0.0	11.1	1.0	27.6	4.7	20.5	0.0	12.9
Prop In Lane	0.28		0.28	0.80		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	328	0	0	349	0	712	27	748	617	499	0	1220
V/C Ratio(X)	0.12	0.00	0.00	0.33	0.00	0.44	0.84	0.91	0.22	0.92	0.00	0.48
Avail Cap(c_a), veh/h	408	0	0	428	0	796	122	774	639	567	0	1220
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	0.0	29.8	0.0	15.1	40.0	23.1	16.2	28.4	0.0	6.8
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.4	21.5	14.0	0.2	18.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.3	0.0	4.8	0.7	17.2	2.0	12.6	0.0	6.5
LnGrp Delay(d),s/veh	28.6	0.0	0.0	30.3	0.0	15.5	61.5	37.1	16.4	47.2	0.0	7.1
LnGrp LOS	C			C		B	E	D	B	D		A
Approach Vol, veh/h		39			426			836			1048	
Approach Delay, s/veh		28.6			19.5			34.4			24.7	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.9	36.4		18.1	5.2	58.0		18.1
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	26.0	33.5		18.5	5.5	54.0		18.5
Max Q Clear Time (g_c+I1), s	22.5	29.6		6.9	3.0	14.9		13.1
Green Ext Time (p_c), s	0.4	2.8		1.6	0.0	12.3		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	27.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	35	45	50	70	50	275	600	105	30	165	530
Future Volume (veh/h)	65	35	45	50	70	50	275	600	105	30	165	530
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1839	1810	1845	1857	1900	1881	1868	1900	1845	1827	1881
Adj Flow Rate, veh/h	73	39	51	56	79	56	309	674	118	34	185	0
Adj No. of Lanes	0	1	1	1	1	0	1	2	0	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	5	3	4	4	1	2	2	3	4	1
Cap, veh/h	136	73	180	215	124	88	379	1208	211	68	415	363
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.21	0.40	0.40	0.04	0.23	0.00
Sat Flow, veh/h	1161	620	1538	1757	1012	718	1792	3021	528	1757	1827	1599
Grp Volume(v), veh/h	112	0	51	56	0	135	309	396	396	34	185	0
Grp Sat Flow(s),veh/h/ln	1781	0	1538	1757	0	1730	1792	1775	1775	1757	1827	1599
Q Serve(g_s), s	2.6	0.0	1.3	1.3	0.0	3.3	7.3	7.6	7.7	0.8	3.9	0.0
Cycle Q Clear(g_c), s	2.6	0.0	1.3	1.3	0.0	3.3	7.3	7.6	7.7	0.8	3.9	0.0
Prop In Lane	0.65		1.00	1.00		0.41	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	209	0	180	215	0	212	379	709	710	68	415	363
V/C Ratio(X)	0.54	0.00	0.28	0.26	0.00	0.64	0.82	0.56	0.56	0.50	0.45	0.00
Avail Cap(c_a), veh/h	1023	0	884	728	0	717	787	1412	1412	257	918	804
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.5	0.0	17.9	17.7	0.0	18.5	16.7	10.3	10.3	20.9	14.8	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.3	0.2	0.0	1.2	1.7	0.4	0.4	2.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.6	0.6	0.0	1.6	3.8	3.8	3.8	0.4	2.0	0.0
LnGrp Delay(d),s/veh	19.3	0.0	18.2	17.9	0.0	19.7	18.3	10.7	10.7	23.0	15.2	0.0
LnGrp LOS	B		B	B		B	B	B	B	C	B	
Approach Vol, veh/h		163			191			1101			219	
Approach Delay, s/veh		18.9			19.2			12.8			16.4	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	21.4		8.7	12.4	13.8		9.5
Change Period (Y+Rc), s	3.0	3.7		3.5	3.0	3.7		4.1
Max Green Setting (Gmax), s	6.5	35.3		25.5	19.5	22.3		18.4
Max Q Clear Time (g_c+I1), s	2.8	9.7		4.6	9.3	5.9		5.3
Green Ext Time (p_c), s	0.0	4.8		0.4	0.3	4.2		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	232.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	295	360	620	220	70	190
Future Vol, veh/h	295	360	620	220	70	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	1	2	2	4	5
Mvmt Flow	324	396	681	242	77	209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1044	681	0	0	681	0
Stage 1	681	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.43	6.21	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	-	-	2.236	-
Pot Cap-1 Maneuver	~ 253	452	-	-	902	-
Stage 1	501	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 228	452	-	-	902	-
Mov Cap-2 Maneuver	~ 228	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	634	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 621	0	2.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	313	902	-
HCM Lane V/C Ratio	-	-	2.3	0.085	-
HCM Control Delay (s)	-	-	$ 621	9.4	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	55.7	0.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	15.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	387	209	70	103	74	260
Future Vol, veh/h	387	209	70	103	74	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	4	4	2	7	5	3
Mvmt Flow	450	243	81	120	86	302

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	693	0	855	572
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	283	-
Critical Hdwy	-	-	4.12	-	6.45	6.23
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.218	-	3.545	3.327
Pot Cap-1 Maneuver	-	-	902	-	325	518
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	902	-	294	518
Mov Cap-2 Maneuver	-	-	-	-	294	-
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	685	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	48.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	443	-	-	902	-
HCM Lane V/C Ratio	0.877	-	-	0.09	-
HCM Control Delay (s)	48.4	-	-	9.4	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	9.1	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	220	266	533	170	35	179	753	546	40	769	40
Future Volume (veh/h)	80	220	266	533	170	35	179	753	546	40	769	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	85	234	283	567	181	37	190	801	581	43	818	43
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	109	441	368	558	620	531	164	1170	788	55	959	523
Arrive On Green	0.06	0.23	0.23	0.16	0.33	0.33	0.10	0.34	0.34	0.03	0.27	0.27
Sat Flow, veh/h	1757	1881	1568	3476	1863	1595	1707	3471	1583	1810	3539	1568
Grp Volume(v), veh/h	85	234	283	567	181	37	190	801	581	43	818	43
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1595	1707	1736	1583	1810	1770	1568
Q Serve(g_s), s	4.0	9.2	14.2	13.5	6.0	1.3	8.1	16.7	24.5	2.0	18.4	1.6
Cycle Q Clear(g_c), s	4.0	9.2	14.2	13.5	6.0	1.3	8.1	16.7	24.5	2.0	18.4	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	441	368	558	620	531	164	1170	788	55	959	523
V/C Ratio(X)	0.78	0.53	0.77	1.02	0.29	0.07	1.16	0.68	0.74	0.79	0.85	0.08
Avail Cap(c_a), veh/h	209	536	447	558	620	531	164	1170	788	107	1026	552
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	28.2	30.1	35.3	20.7	19.2	38.0	24.0	16.8	40.5	29.1	19.2
Incr Delay (d2), s/veh	11.2	2.1	9.1	42.5	0.6	0.1	118.5	2.2	4.4	21.7	7.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	5.0	7.0	9.7	3.2	0.6	9.2	8.4	11.5	1.3	10.0	0.7
LnGrp Delay(d),s/veh	50.1	30.3	39.2	77.8	21.3	19.3	156.6	26.2	21.2	62.2	36.7	19.4
LnGrp LOS	D	C	D	F	C	B	F	C	C	E	D	B
Approach Vol, veh/h		602			785			1572			904	
Approach Delay, s/veh		37.2			62.0			40.1			37.1	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	33.9	18.0	25.3	12.6	28.3	9.7	33.5
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	27.5	13.5	24.0	8.1	24.4	10.0	27.5
Max Q Clear Time (g_c+I1), s	4.0	26.5	15.5	16.2	10.1	20.4	6.0	8.0
Green Ext Time (p_c), s	0.0	1.0	0.0	3.6	0.0	2.4	0.1	6.8

Intersection Summary	
HCM 2010 Ctrl Delay	43.4
HCM 2010 LOS	D

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/04/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	270	115	0	86	0	1370	280	250	1209	110
Future Volume (vph)	0	0	270	115	0	86	0	1370	280	250	1209	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1597	1805		1455		5036	1599	1752	5030	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1597	1805		1455		5036	1599	1752	5030	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	281	120	0	90	0	1427	292	260	1259	115
RTOR Reduction (vph)	0	0	168	0	0	66	0	0	156	0	16	0
Lane Group Flow (vph)	0	0	113	120	0	24	0	1427	136	260	1358	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			6.0	6.5		17.0		23.5	30.0	10.5	38.0	
Effective Green, g (s)			6.0	6.5		17.0		23.5	30.0	10.5	38.0	
Actuated g/C Ratio			0.09	0.10		0.26		0.36	0.47	0.16	0.59	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			148	181		383		1834	743	285	2963	
v/s Ratio Prot				c0.07				c0.28	0.02	c0.15	0.27	
v/s Ratio Perm			c0.07			0.02			0.07			
v/c Ratio			0.76	0.66		0.06		0.78	0.18	0.91	0.46	
Uniform Delay, d1			28.6	27.9		17.8		18.2	10.1	26.5	7.5	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			20.7	8.8		0.1		2.3	0.1	30.9	0.2	
Delay (s)			49.2	36.7		17.9		20.5	10.2	57.4	7.6	
Level of Service			D	D		B		C	B	E	A	
Approach Delay (s)		49.2			28.7			18.7			15.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	298	20	210	140	30	65	210	1514	85	100	1508	207
Future Volume (veh/h)	298	20	210	140	30	65	210	1514	85	100	1508	207
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1863	1881	1845	1863	1881
Adj Flow Rate, veh/h	310	21	219	146	31	68	219	1577	89	104	1571	216
Adj No. of Lanes	1	1	2	1	1	1	1	2	1	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	1	3	2	1
Cap, veh/h	345	301	459	179	120	110	256	1771	799	132	2177	675
Arrive On Green	0.20	0.16	0.16	0.10	0.07	0.07	0.15	0.50	0.50	0.07	0.43	0.43
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	3539	1597	1757	5085	1577
Grp Volume(v), veh/h	310	21	219	146	31	68	219	1577	89	104	1571	216
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1770	1597	1757	1695	1577
Q Serve(g_s), s	18.7	1.0	7.7	8.8	1.8	4.4	13.2	43.2	3.2	6.3	27.5	9.8
Cycle Q Clear(g_c), s	18.7	1.0	7.7	8.8	1.8	4.4	13.2	43.2	3.2	6.3	27.5	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	301	459	179	120	110	256	1771	799	132	2177	675
V/C Ratio(X)	0.90	0.07	0.48	0.82	0.26	0.62	0.86	0.89	0.11	0.79	0.72	0.32
Avail Cap(c_a), veh/h	485	510	777	490	491	450	728	1771	799	327	2364	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	38.0	40.7	47.3	47.5	48.7	44.8	24.2	14.2	48.9	25.5	20.4
Incr Delay (d2), s/veh	15.0	0.1	0.8	8.7	1.1	5.5	8.0	6.5	0.1	10.1	1.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	0.5	3.0	4.7	0.9	2.1	6.9	22.6	1.4	3.4	13.1	4.3
LnGrp Delay(d),s/veh	57.0	38.0	41.5	56.0	48.6	54.2	52.8	30.7	14.4	59.0	26.8	21.0
LnGrp LOS	E	D	D	E	D	D	D	C	B	E	C	C
Approach Vol, veh/h		550			245			1885			1891	
Approach Delay, s/veh		50.1			54.6			32.5			27.9	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	58.8	15.0	21.7	19.8	51.0	25.3	11.3
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	50.0	30.0	30.0	45.0	50.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	8.3	45.2	10.8	9.7	15.2	29.5	20.7	6.4
Green Ext Time (p_c), s	0.2	4.8	0.3	1.3	0.6	16.5	0.7	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	33.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	0	290	1090	150	397	400	1457	240	0	1808	25
Future Volume (veh/h)	80	0	290	1090	150	397	400	1457	240	0	1808	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1830	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	83	0	302	1135	350	285	417	1518	250	0	1883	26
Adj No. of Lanes	1	0	1	2	1	1	1	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	75	0	0	1187	465	384	380	2950	910	0	1650	539
Arrive On Green	0.04	0.00	0.00	0.33	0.25	0.25	0.42	1.00	1.00	0.00	0.33	0.33
Sat Flow, veh/h	1810	83		3548	1830	1509	1810	5085	1568	0	5103	1615
Grp Volume(v), veh/h	83	197.7		1135	350	285	417	1518	250	0	1883	26
Grp Sat Flow(s),veh/h/ln	1810	F		1774	1830	1509	1810	1695	1568	0	1647	1615
Q Serve(g_s), s	5.4			40.7	22.9	22.6	27.3	0.0	0.0	0.0	43.4	1.4
Cycle Q Clear(g_c), s	5.4			40.7	22.9	22.6	27.3	0.0	0.0	0.0	43.4	1.4
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	75			1187	465	384	380	2950	910	0	1650	539
V/C Ratio(X)	1.10			0.96	0.75	0.74	1.10	0.51	0.27	0.00	1.14	0.05
Avail Cap(c_a), veh/h	75			1348	549	453	380	2950	910	0	1650	539
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.57	0.57
Uniform Delay (d), s/veh	62.3			42.3	44.7	44.5	37.7	0.0	0.0	0.0	43.3	29.3
Incr Delay (d2), s/veh	135.0			13.9	3.8	4.1	75.0	0.6	0.7	0.0	68.1	0.1
Initial Q Delay(d3),s/veh	0.3			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5			22.1	12.1	9.9	21.4	0.2	0.2	0.0	30.1	0.6
LnGrp Delay(d),s/veh	197.7			56.2	48.5	48.7	112.7	0.6	0.7	0.0	111.4	29.4
LnGrp LOS	F			E	D	D	F	A	A		F	C
Approach Vol, veh/h					1770			2185			1909	
Approach Delay, s/veh					53.5			22.0			110.3	
Approach LOS					D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		81.6	48.4		32.0	49.6	10.0	38.4
Change Period (Y+Rc), s		6.2	4.9		* 4.7	6.2	4.6	5.3
Max Green Setting (Gmax), s		69.5	49.4		* 27	37.5	5.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	42.7		29.3	45.4	7.4	24.9
Green Ext Time (p_c), s		23.0	0.8		0.0	0.0	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	62.2
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	679	285	85	125	0	345	0	1409	100	435	1051	442
Future Volume (veh/h)	679	285	85	125	0	345	0	1409	100	435	1051	442
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1827	1900	0	1900	0	1776	1900	1881	1845	1827
Adj Flow Rate, veh/h	700	294	88	129	0	356	0	1453	103	448	1084	0
Adj No. of Lanes	2	2	1	1	0	1	0	4	1	2	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	4	0	0	0	0	7	0	1	3	4
Cap, veh/h	767	363	159	154	0	0	0	1566	414	1355	2433	1078
Arrive On Green	0.22	0.10	0.10	0.08	0.00	0.00	0.00	0.26	0.26	0.78	1.00	0.00
Sat Flow, veh/h	3442	3539	1553	1810	129		0	6357	1615	3476	3505	1553
Grp Volume(v), veh/h	700	294	88	129	79.2		0	1453	103	448	1084	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1553	1810	E		0	1527	1615	1738	1752	1553
Q Serve(g_s), s	25.8	10.6	7.0	9.1			0.0	30.2	5.1	5.0	0.0	0.0
Cycle Q Clear(g_c), s	25.8	10.6	7.0	9.1			0.0	30.2	5.1	5.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00			0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	767	363	159	154			0	1566	414	1355	2433	1078
V/C Ratio(X)	0.91	0.81	0.55	0.84			0.00	0.93	0.25	0.33	0.45	0.00
Avail Cap(c_a), veh/h	810	1143	502	187			0	1607	425	1355	2433	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00			0.00	0.93	0.93	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.3	57.1	55.5	58.6			0.0	47.2	23.0	9.3	0.0	0.0
Incr Delay (d2), s/veh	14.0	1.7	1.1	20.6			0.0	10.4	1.3	0.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.7	5.3	3.1	5.5			0.0	13.8	2.4	2.4	0.2	0.0
LnGrp Delay(d),s/veh	63.3	58.8	56.6	79.2			0.0	57.6	24.3	9.3	0.6	0.0
LnGrp LOS	E	E	E	E				E	C	A	A	
Approach Vol, veh/h		1082						1556			1532	
Approach Delay, s/veh		61.5						55.4			3.1	
Approach LOS		E						E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6	7	
Phs Duration (G+Y+Rc), s	56.9	39.5	15.6	17.9		96.4	33.6	
Change Period (Y+Rc), s	6.2	* 6.2	4.6	4.6		6.2	4.6	
Max Green Setting (Gmax), s	20.4	* 34	13.4	42.0		59.2	30.6	
Max Q Clear Time (g_c+I1), s	7.0	32.2	11.1	12.6		2.0	27.8	
Green Ext Time (p_c), s	3.2	1.2	0.0	0.8		3.6	0.7	

Intersection Summary	
HCM 2010 Ctrl Delay	39.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	12	58	10	14	100	46	1239	75	0	1236	201
Future Volume (veh/h)	170	12	58	10	14	100	46	1239	75	0	1236	201
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1900	1568	1776	1863	1865	1900	0	1863	1863
Adj Flow Rate, veh/h	177	12	60	10	15	104	48	1291	78	0	1288	209
Adj No. of Lanes	1	1	0	0	1	1	1	4	0	0	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	7	2	2	2	0	2	2
Cap, veh/h	221	34	169	55	82	134	69	3967	239	0	1938	867
Arrive On Green	0.12	0.12	0.12	0.09	0.09	0.09	0.04	0.64	0.64	0.00	0.55	0.55
Sat Flow, veh/h	1774	271	1353	615	922	1509	1774	6234	376	0	3632	1583
Grp Volume(v), veh/h	177	0	72	25	0	104	48	996	373	0	1288	209
Grp Sat Flow(s),veh/h/ln	1774	0	1624	1537	0	1509	1774	1604	1798	0	1770	1583
Q Serve(g_s), s	8.7	0.0	3.7	1.4	0.0	6.1	2.4	8.5	8.6	0.0	23.3	6.2
Cycle Q Clear(g_c), s	8.7	0.0	3.7	1.4	0.0	6.1	2.4	8.5	8.6	0.0	23.3	6.2
Prop In Lane	1.00		0.83	0.40		1.00	1.00		0.21	0.00		1.00
Lane Grp Cap(c), veh/h	221	0	203	137	0	134	69	3062	1144	0	1938	867
V/C Ratio(X)	0.80	0.00	0.36	0.18	0.00	0.78	0.70	0.33	0.33	0.00	0.66	0.24
Avail Cap(c_a), veh/h	355	0	325	307	0	302	99	3062	1144	0	1938	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.85	0.85	0.85	0.00	0.87	0.87
Uniform Delay (d), s/veh	38.3	0.0	36.1	38.0	0.0	40.1	42.7	7.5	7.5	0.0	14.5	10.6
Incr Delay (d2), s/veh	6.6	0.0	1.1	0.6	0.0	9.2	10.3	0.2	0.6	0.0	1.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	1.7	0.6	0.0	2.9	1.4	3.8	4.5	0.0	11.7	2.8
LnGrp Delay(d),s/veh	44.8	0.0	37.1	38.6	0.0	49.3	53.0	7.7	8.2	0.0	16.1	11.2
LnGrp LOS	D		D	D		D	D	A	A		B	B
Approach Vol, veh/h		249			129			1417			1497	
Approach Delay, s/veh		42.6			47.2			9.4			15.4	
Approach LOS		D			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		8
Phs Duration (G+Y+Rc), s		61.8		15.7	8.0	53.8		12.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		40.5		18.0	5.0	31.0		18.0
Max Q Clear Time (g_c+I1), s		10.6		10.7	4.4	25.3		8.1
Green Ext Time (p_c), s		24.5		0.5	0.0	5.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	105	500	75	205	5	515	1110	175	115	901	255
Future Volume (veh/h)	245	105	500	75	205	5	515	1110	175	115	901	255
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1827	1900	1900	1900	1863	1881	1727	1863	1900
Adj Flow Rate, veh/h	253	108	515	77	211	5	531	1144	180	119	929	263
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	4	0	0	0	2	1	10	2	0
Cap, veh/h	244	612	520	117	422	359	498	2157	677	140	828	377
Arrive On Green	0.13	0.32	0.32	0.03	0.22	0.22	0.28	0.42	0.42	0.09	0.23	0.23
Sat Flow, veh/h	1810	1900	1615	3375	1900	1615	1810	5085	1597	1645	3539	1612
Grp Volume(v), veh/h	253	108	515	77	211	5	531	1144	180	119	929	263
Grp Sat Flow(s),veh/h/ln	1810	1900	1615	1688	1900	1615	1810	1695	1597	1645	1770	1612
Q Serve(g_s), s	19.9	6.0	46.9	3.3	14.4	0.4	40.7	24.7	10.8	10.5	34.6	22.1
Cycle Q Clear(g_c), s	19.9	6.0	46.9	3.3	14.4	0.4	40.7	24.7	10.8	10.5	34.6	22.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	612	520	117	422	359	498	2157	677	140	828	377
V/C Ratio(X)	1.04	0.18	0.99	0.66	0.50	0.01	1.07	0.53	0.27	0.85	1.12	0.70
Avail Cap(c_a), veh/h	244	612	520	167	450	382	498	2157	677	218	828	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.0	36.0	49.9	70.5	50.3	44.9	53.6	31.6	27.6	66.7	56.6	51.8
Incr Delay (d2), s/veh	68.1	0.2	36.9	6.1	1.1	0.0	59.0	0.3	0.3	16.7	70.3	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.5	3.2	26.2	1.7	7.7	0.2	28.4	11.6	4.8	5.4	24.9	10.5
LnGrp Delay(d),s/veh	132.1	36.2	86.8	76.6	51.4	44.9	112.6	31.9	27.9	83.3	126.9	57.6
LnGrp LOS	F	D	F	E	D	D	F	C	C	F	F	E
Approach Vol, veh/h		876			293			1855			1311	
Approach Delay, s/veh		93.6			57.9			54.6			109.1	
Approach LOS		F			E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	68.5	9.6	52.6	45.2	40.4	24.4	37.8
Change Period (Y+Rc), s	4.5	5.8	4.5	5.0	4.5	5.8	4.5	5.0
Max Green Setting (Gmax), s	19.6	55.7	7.3	47.6	40.7	34.6	19.9	35.0
Max Q Clear Time (g_c+I1), s	12.5	26.7	5.3	48.9	42.7	36.6	21.9	16.4
Green Ext Time (p_c), s	0.1	23.0	0.0	0.0	0.0	0.0	0.0	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	79.2
HCM 2010 LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	50	35	1629	1461	70
Future Volume (veh/h)	90	50	35	1629	1461	70
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1900	1863	1847	1900
Adj Flow Rate, veh/h	98	54	38	1771	1588	76
Adj No. of Lanes	2	1	1	2	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	0	2	3	3
Cap, veh/h	327	155	76	2380	2603	125
Arrive On Green	0.10	0.10	0.04	0.67	0.53	0.53
Sat Flow, veh/h	3408	1615	1810	3632	5097	236
Grp Volume(v), veh/h	98	54	38	1771	1082	582
Grp Sat Flow(s),veh/h/ln	1704	1615	1810	1770	1681	1805
Q Serve(g_s), s	1.2	1.4	0.9	14.4	9.9	9.9
Cycle Q Clear(g_c), s	1.2	1.4	0.9	14.4	9.9	9.9
Prop In Lane	1.00	1.00	1.00			0.13
Lane Grp Cap(c), veh/h	327	155	76	2380	1775	953
V/C Ratio(X)	0.30	0.35	0.50	0.74	0.61	0.61
Avail Cap(c_a), veh/h	1433	679	210	2517	1775	953
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	18.6	20.6	4.7	7.2	7.2
Incr Delay (d2), s/veh	0.5	1.3	4.9	1.2	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.7	0.6	7.3	4.7	5.2
LnGrp Delay(d),s/veh	19.0	19.9	25.6	6.0	7.9	8.5
LnGrp LOS	B	B	C	A	A	A
Approach Vol, veh/h	152			1809	1664	
Approach Delay, s/veh	19.4			6.4	8.1	
Approach LOS	B			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.7	6.4	28.9				35.3
Change Period (Y+Rc), s		4.5	4.5	5.7				5.7
Max Green Setting (Gmax), s		18.5	5.1	21.7				31.3
Max Q Clear Time (g_c+I1), s		3.4	2.9	11.9				16.4
Green Ext Time (p_c), s		0.4	0.0	9.7				13.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	285	320	80	170	188	265	1290	75	237	1103	136
Future Volume (veh/h)	187	285	320	80	170	188	265	1290	75	237	1103	136
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1881	1863	1846	1900	1827	1858	1900	1863	1863	1827
Adj Flow Rate, veh/h	195	297	333	83	177	196	276	1344	78	247	1149	142
Adj No. of Lanes	1	2	1	1	2	0	2	2	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	1	2	5	5	4	2	2	2	2	4
Cap, veh/h	226	880	393	95	306	266	351	1334	77	238	2156	646
Arrive On Green	0.13	0.25	0.25	0.05	0.17	0.17	0.10	0.39	0.39	0.13	0.42	0.42
Sat Flow, veh/h	1774	3539	1580	1774	1754	1522	3375	3390	196	1774	5085	1524
Grp Volume(v), veh/h	195	297	333	83	177	196	276	698	724	247	1149	142
Grp Sat Flow(s),veh/h/ln	1774	1770	1580	1774	1754	1522	1688	1765	1822	1774	1695	1524
Q Serve(g_s), s	12.0	7.7	22.4	5.2	10.4	13.6	8.9	44.0	44.0	15.0	18.8	6.6
Cycle Q Clear(g_c), s	12.0	7.7	22.4	5.2	10.4	13.6	8.9	44.0	44.0	15.0	18.8	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	226	880	393	95	306	266	351	695	717	238	2156	646
V/C Ratio(X)	0.86	0.34	0.85	0.87	0.58	0.74	0.79	1.01	1.01	1.04	0.53	0.22
Avail Cap(c_a), veh/h	317	982	438	95	306	266	453	695	717	238	2156	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	34.5	40.0	52.5	42.4	43.7	48.9	33.9	33.9	48.4	24.0	20.5
Incr Delay (d2), s/veh	15.6	0.8	18.2	53.3	3.3	11.1	10.0	35.4	35.9	68.5	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	3.9	11.8	3.9	5.3	6.5	4.7	28.1	29.1	11.8	8.8	2.8
LnGrp Delay(d),s/veh	63.4	35.3	58.2	105.8	45.7	54.8	58.8	69.3	69.8	116.9	24.3	20.7
LnGrp LOS	E	D	E	F	D	D	E	F	F	F	C	C
Approach Vol, veh/h		825			456			1698			1538	
Approach Delay, s/veh		51.2			60.5			67.8			38.8	
Approach LOS		D			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	49.0	10.0	33.8	15.6	52.4	18.3	25.5
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	4.0	5.0	4.0	6.0
Max Green Setting (Gmax), s	15.0	44.0	6.0	31.0	15.0	44.0	20.0	17.0
Max Q Clear Time (g_c+I1), s	17.0	46.0	7.2	24.4	10.9	20.8	14.0	15.6
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.7	22.5	0.3	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	54.2
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	105	145	35	40	25	140	636	75	25	549	90
Future Volume (veh/h)	70	105	145	35	40	25	140	636	75	25	549	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1644	1810	1900	1800	1900	1792	1804	1900	1597	1863	1863
Adj Flow Rate, veh/h	77	115	159	38	44	27	154	699	82	27	603	99
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	65	63	514	68	54	541	189	722	85	43	695	578
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.11	0.46	0.46	0.03	0.37	0.37
Sat Flow, veh/h	0	189	1536	0	161	1614	1707	1585	186	1521	1863	1548
Grp Volume(v), veh/h	192	0	159	82	0	27	154	0	781	27	603	99
Grp Sat Flow(s),veh/h/ln	189	0	1536	161	0	1614	1707	0	1771	1521	1863	1548
Q Serve(g_s), s	0.0	0.0	5.9	0.0	0.0	0.9	6.8	0.0	33.2	1.4	23.2	3.3
Cycle Q Clear(g_c), s	25.9	0.0	5.9	25.9	0.0	0.9	6.8	0.0	33.2	1.4	23.2	3.3
Prop In Lane	0.40		1.00	0.46		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	129	0	514	122	0	541	189	0	807	43	695	578
V/C Ratio(X)	1.49	0.00	0.31	0.67	0.00	0.05	0.82	0.00	0.97	0.62	0.87	0.17
Avail Cap(c_a), veh/h	129	0	514	122	0	541	223	0	807	108	723	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	19.1	22.4	0.0	17.4	33.6	0.0	20.5	37.1	22.4	16.2
Incr Delay (d2), s/veh	257.9	0.0	0.4	14.0	0.0	0.0	18.5	0.0	24.4	15.9	12.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	0.0	2.5	2.2	0.0	0.4	4.2	0.0	21.5	0.8	14.2	1.5
LnGrp Delay(d),s/veh	284.5	0.0	19.5	36.4	0.0	17.4	52.1	0.0	44.9	53.1	34.6	16.6
LnGrp LOS	F		B	D		B	D		D	D	C	B
Approach Vol, veh/h		351			109			935			729	
Approach Delay, s/veh		164.5			31.7			46.1			32.8	
Approach LOS		F			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	40.6		30.4	12.7	34.3		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.5	34.6		25.9	10.1	30.0		25.9
Max Q Clear Time (g_c+I1), s	3.4	35.2		27.9	8.8	25.2		27.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.1	3.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	60.4
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	145	45	471	80	145	15	596	532	155	540	45
Future Volume (veh/h)	76	145	45	471	80	145	15	596	532	155	540	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1881	1855	1881	1900	1845	1881	1827	1859	1900
Adj Flow Rate, veh/h	81	154	48	562	0	154	16	634	566	165	574	48
Adj No. of Lanes	1	2	0	2	0	1	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	6	1	0	3	1	4	2	2
Cap, veh/h	200	302	91	753	0	333	27	1212	552	175	1421	119
Arrive On Green	0.11	0.11	0.11	0.21	0.00	0.21	0.01	0.35	0.35	0.10	0.43	0.43
Sat Flow, veh/h	1810	2727	820	3583	0	1588	1810	3505	1596	1740	3293	275
Grp Volume(v), veh/h	81	100	102	562	0	154	16	634	566	165	307	315
Grp Sat Flow(s),veh/h/ln	1810	1805	1742	1792	0	1588	1810	1752	1596	1740	1766	1802
Q Serve(g_s), s	3.3	4.2	4.4	11.7	0.0	6.7	0.7	11.5	27.5	7.5	9.5	9.6
Cycle Q Clear(g_c), s	3.3	4.2	4.4	11.7	0.0	6.7	0.7	11.5	27.5	7.5	9.5	9.6
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	200	200	193	753	0	333	27	1212	552	175	762	778
V/C Ratio(X)	0.40	0.50	0.53	0.75	0.00	0.46	0.59	0.52	1.03	0.94	0.40	0.40
Avail Cap(c_a), veh/h	637	636	613	1262	0	559	91	1212	552	175	762	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	33.3	33.4	29.4	0.0	27.5	38.9	20.8	26.0	35.5	15.6	15.6
Incr Delay (d2), s/veh	1.3	1.9	2.2	1.5	0.0	1.0	18.8	0.6	44.8	51.3	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.2	2.2	5.9	0.0	3.0	0.5	5.6	18.8	6.1	4.7	4.8
LnGrp Delay(d),s/veh	34.2	35.2	35.6	30.9	0.0	28.5	57.7	21.3	70.8	86.9	16.0	16.0
LnGrp LOS	C	D	D	C		C	E	C	F	F	B	B
Approach Vol, veh/h		283			716			1216			787	
Approach Delay, s/veh		35.1			30.4			44.8			30.9	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	32.5		13.8	5.2	39.3		21.2
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		4.5
Max Green Setting (Gmax), s	8.0	27.5		28.0	4.0	31.5		28.0
Max Q Clear Time (g_c+I1), s	9.5	29.5		6.4	2.7	11.6		13.7
Green Ext Time (p_c), s	0.0	0.0		1.3	0.0	14.0		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	36.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	730	25	25	505	515	50	20	25	400	20	222
Future Volume (veh/h)	333	730	25	25	505	515	50	20	25	400	20	222
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1848	1900	1881	1876	1863
Adj Flow Rate, veh/h	354	777	27	27	537	0	53	21	27	441	0	236
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	315	1551	54	39	1023	445	154	62	80	773	0	340
Arrive On Green	0.18	0.44	0.44	0.02	0.29	0.00	0.09	0.09	0.09	0.22	0.00	0.22
Sat Flow, veh/h	1792	3525	122	1723	3574	1553	1810	729	938	3583	0	1575
Grp Volume(v), veh/h	354	394	410	27	537	0	53	0	48	441	0	236
Grp Sat Flow(s),veh/h/ln	1792	1788	1860	1723	1787	1553	1810	0	1667	1792	0	1575
Q Serve(g_s), s	14.5	13.0	13.0	1.3	10.4	0.0	2.3	0.0	2.2	9.1	0.0	11.4
Cycle Q Clear(g_c), s	14.5	13.0	13.0	1.3	10.4	0.0	2.3	0.0	2.2	9.1	0.0	11.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	315	787	818	39	1023	445	154	0	142	773	0	340
V/C Ratio(X)	1.12	0.50	0.50	0.70	0.52	0.00	0.34	0.00	0.34	0.57	0.00	0.69
Avail Cap(c_a), veh/h	315	787	818	123	1172	509	154	0	142	1392	0	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	16.6	16.6	40.0	24.7	0.0	35.5	0.0	35.5	28.9	0.0	29.8
Incr Delay (d2), s/veh	87.8	1.8	1.7	20.4	1.5	0.0	6.0	0.0	6.4	0.9	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	6.7	7.0	0.8	5.4	0.0	1.4	0.0	1.3	4.6	0.0	5.3
LnGrp Delay(d),s/veh	121.7	18.4	18.3	60.4	26.2	0.0	41.5	0.0	41.9	29.8	0.0	33.4
LnGrp LOS	F	B	B	E	C		D		D	C		C
Approach Vol, veh/h		1158			564			101			677	
Approach Delay, s/veh		49.9			27.8			41.7			31.1	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	6.3	41.2		22.8	19.0	28.6
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	5.9	35.6		32.0	14.5	27.0
Max Q Clear Time (g_c+I1), s		4.3	3.3	15.0		13.4	16.5	12.4
Green Ext Time (p_c), s		0.1	0.0	16.1		3.7	0.0	11.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	725	470	445	895	0	0	0	0	45	5	190
Future Volume (veh/h)	0	725	470	445	895	0	0	0	0	45	5	190
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1845	1863	0				1827	1864	1900
Adj Flow Rate, veh/h	0	763	495	468	942	0				47	5	200
Adj No. of Lanes	0	2	1	1	2	0				1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	3	2	0				4	0	4
Cap, veh/h	0	1403	626	501	2632	0				268	6	239
Arrive On Green	0.00	0.40	0.40	0.29	0.74	0.00				0.15	0.15	0.15
Sat Flow, veh/h	0	3632	1580	1757	3632	0				1740	39	1551
Grp Volume(v), veh/h	0	763	495	468	942	0				47	0	205
Grp Sat Flow(s),veh/h/ln	0	1770	1580	1757	1770	0				1740	0	1590
Q Serve(g_s), s	0.0	14.9	24.8	23.4	8.4	0.0				2.1	0.0	11.3
Cycle Q Clear(g_c), s	0.0	14.9	24.8	23.4	8.4	0.0				2.1	0.0	11.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.98
Lane Grp Cap(c), veh/h	0	1403	626	501	2632	0				268	0	245
V/C Ratio(X)	0.00	0.54	0.79	0.93	0.36	0.00				0.18	0.00	0.84
Avail Cap(c_a), veh/h	0	1403	626	554	2632	0				445	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.85	0.85	0.54	0.54	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.9	23.9	31.3	4.0	0.0				33.1	0.0	37.0
Incr Delay (d2), s/veh	0.0	1.3	8.4	13.5	0.2	0.0				0.1	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.6	12.2	13.2	4.1	0.0				1.0	0.0	5.2
LnGrp Delay(d),s/veh	0.0	22.2	32.3	44.9	4.2	0.0				33.2	0.0	40.2
LnGrp LOS		C	C	D	A					C		D
Approach Vol, veh/h		1258			1410						252	
Approach Delay, s/veh		26.2			17.7						38.9	
Approach LOS		C			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	31.3	40.8		18.0		72.0		
Change Period (Y+Rc), s	5.6	5.1		4.1		5.1		
Max Green Setting (Gmax), s	28.4	23.8		23.0		57.8		
Max Q Clear Time (g_c+I1), s	25.4	26.8		13.3		10.4		
Green Ext Time (p_c), s	0.3	0.0		0.6		13.6		

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
19: I-80 EB Ramps & Rocklin Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	565	0	0	855	100	480	5	410	0	0	0
Future Volume (veh/h)	205	565	0	0	855	100	480	5	410	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1881	1881	0	0	1845	1900	1845	1828	1827			
Adj Flow Rate, veh/h	228	628	0	0	950	111	677	0	306			
Adj No. of Lanes	1	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Percent Heavy Veh, %	1	1	0	0	3	0	3	33	4			
Cap, veh/h	278	2121	0	0	1313	605	873	0	386			
Arrive On Green	0.16	0.59	0.00	0.00	0.37	0.37	0.25	0.00	0.25			
Sat Flow, veh/h	1792	3668	0	0	3597	1615	3514	0	1553			
Grp Volume(v), veh/h	228	628	0	0	950	111	677	0	306			
Grp Sat Flow(s),veh/h/ln	1792	1787	0	0	1752	1615	1757	0	1553			
Q Serve(g_s), s	6.8	4.8	0.0	0.0	12.8	2.5	9.9	0.0	10.1			
Cycle Q Clear(g_c), s	6.8	4.8	0.0	0.0	12.8	2.5	9.9	0.0	10.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	278	2121	0	0	1313	605	873	0	386			
V/C Ratio(X)	0.82	0.30	0.00	0.00	0.72	0.18	0.78	0.00	0.79			
Avail Cap(c_a), veh/h	309	2121	0	0	1313	605	952	0	421			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.86	0.86	0.00	0.00	0.91	0.91	1.00	0.00	1.00			
Uniform Delay (d), s/veh	22.5	5.5	0.0	0.0	14.8	11.5	19.2	0.0	19.4			
Incr Delay (d2), s/veh	11.4	0.3	0.0	0.0	3.2	0.6	4.1	0.0	10.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	2.4	0.0	0.0	6.6	1.2	5.3	0.0	5.4			
LnGrp Delay(d),s/veh	33.9	5.8	0.0	0.0	17.9	12.2	23.4	0.0	29.4			
LnGrp LOS	C	A			B	B	C		C			
Approach Vol, veh/h		856			1061			983				
Approach Delay, s/veh		13.3			17.3			25.3				
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		37.2			12.0	25.2		17.8
Change Period (Y+Rc), s		4.6			3.5	4.6		4.1
Max Green Setting (Gmax), s		31.4			9.5	18.4		14.9
Max Q Clear Time (g_c+I1), s		6.8			8.8	14.8		12.1
Green Ext Time (p_c), s		9.0			0.0	2.5		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	710	205	44	710	0	245	0	59	0	0	0
Future Volume (veh/h)	60	710	205	44	710	0	245	0	59	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1867	1900	1900	1845	0	1900	0	1900			
Adj Flow Rate, veh/h	65	772	223	48	772	0	266	0	64			
Adj No. of Lanes	1	3	0	1	3	0	1	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	2	2	0	3	0	0	0	0			
Cap, veh/h	136	1752	501	73	2080	0	361	0	322			
Arrive On Green	0.08	0.45	0.45	0.04	0.41	0.00	0.20	0.00	0.20			
Sat Flow, veh/h	1810	3915	1118	1810	5202	0	1810	0	1615			
Grp Volume(v), veh/h	65	669	326	48	772	0	266	0	64			
Grp Sat Flow(s),veh/h/ln	1810	1699	1635	1810	1679	0	1810	0	1615			
Q Serve(g_s), s	1.5	5.9	5.9	1.1	4.6	0.0	6.0	0.0	1.4			
Cycle Q Clear(g_c), s	1.5	5.9	5.9	1.1	4.6	0.0	6.0	0.0	1.4			
Prop In Lane	1.00		0.68	1.00		0.00	1.00		1.00			
Lane Grp Cap(c), veh/h	136	1521	732	73	2080	0	361	0	322			
V/C Ratio(X)	0.48	0.44	0.45	0.65	0.37	0.00	0.74	0.00	0.20			
Avail Cap(c_a), veh/h	251	1524	734	234	2213	0	900	0	803			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	19.2	8.2	8.2	20.4	8.8	0.0	16.2	0.0	14.4			
Incr Delay (d2), s/veh	2.6	0.6	1.2	9.5	0.3	0.0	2.9	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	2.8	2.9	0.8	2.1	0.0	3.2	0.0	0.7			
LnGrp Delay(d),s/veh	21.8	8.8	9.4	29.9	9.1	0.0	19.2	0.0	14.7			
LnGrp LOS	C	A	A	C	A		B		B			
Approach Vol, veh/h		1060			820			330				
Approach Delay, s/veh		9.8			10.3			18.3				
Approach LOS		A			B			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2			5	6		8
Phs Duration (G+Y+Rc), s	5.8	24.4			7.3	22.9		13.1
Change Period (Y+Rc), s	4.0	5.0			4.0	5.0		4.5
Max Green Setting (Gmax), s	5.6	19.4			6.0	19.0		21.5
Max Q Clear Time (g_c+I1), s	3.1	7.9			3.5	6.6		8.0
Green Ext Time (p_c), s	0.0	10.4			0.0	11.3		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	10	1650	1594	0
Future Vol, veh/h	0	0	10	1650	1594	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	10	1701	1643	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	822	1643	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	276	193	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	276	193	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	193	-	-	-	-
HCM Lane V/C Ratio	0.053	-	-	-	-
HCM Control Delay (s)	24.7	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	255	90	210	185	70	40	483	405	145	317	120
Future Volume (veh/h)	140	255	90	210	185	70	40	483	405	145	317	120
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1872	1900	1863	1863	1900	1810	1863	1900	1863	1841	1900
Adj Flow Rate, veh/h	152	277	98	228	201	76	43	525	440	158	345	130
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	5	2	2	2	1	1
Cap, veh/h	186	279	99	254	324	123	63	449	376	355	1022	379
Arrive On Green	0.10	0.21	0.21	0.14	0.25	0.25	0.04	0.25	0.25	0.20	0.41	0.41
Sat Flow, veh/h	1810	1322	468	1774	1289	487	1723	1829	1533	1774	2500	927
Grp Volume(v), veh/h	152	0	375	228	0	277	43	508	457	158	240	235
Grp Sat Flow(s),veh/h/ln	1810	0	1790	1774	0	1777	1723	1770	1592	1774	1749	1678
Q Serve(g_s), s	7.4	0.0	18.8	11.4	0.0	12.4	2.2	22.1	22.1	7.0	8.4	8.7
Cycle Q Clear(g_c), s	7.4	0.0	18.8	11.4	0.0	12.4	2.2	22.1	22.1	7.0	8.4	8.7
Prop In Lane	1.00		0.26	1.00		0.27	1.00		0.96	1.00		0.55
Lane Grp Cap(c), veh/h	186	0	378	254	0	447	63	435	391	355	715	686
V/C Ratio(X)	0.82	0.00	0.99	0.90	0.00	0.62	0.68	1.17	1.17	0.45	0.34	0.34
Avail Cap(c_a), veh/h	227	0	378	254	0	447	126	435	391	355	715	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.49	0.00	0.49	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	0.0	35.4	37.9	0.0	29.9	42.8	34.0	34.0	31.6	18.2	18.3
Incr Delay (d2), s/veh	17.1	0.0	44.2	18.1	0.0	1.3	12.2	98.2	100.2	4.0	1.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	13.9	6.9	0.0	6.2	1.3	22.6	20.5	3.8	4.3	4.2
LnGrp Delay(d),s/veh	56.7	0.0	79.6	56.0	0.0	31.2	55.0	132.2	134.2	35.6	19.5	19.6
LnGrp LOS	E		E	E		C	E	F	F	D	B	B
Approach Vol, veh/h		527			505			1008			633	
Approach Delay, s/veh		73.0			42.4			129.8			23.6	
Approach LOS		E			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	26.6	17.4	23.5	7.8	41.3	13.8	27.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	22.1	12.9	19.0	6.6	33.5	11.3	20.6
Max Q Clear Time (g_c+I1), s	9.0	24.1	13.4	20.8	4.2	10.7	9.4	14.4
Green Ext Time (p_c), s	0.3	0.0	0.0	0.0	0.0	10.5	0.1	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	76.9
HCM 2010 LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	689	80	32	554	10	95	5	33	25	5	85
Future Volume (veh/h)	30	689	80	32	554	10	95	5	33	25	5	85
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1867	1900	1900	1863	1900	1900	1790	1900	1900	1900	1900
Adj Flow Rate, veh/h	32	725	84	34	583	11	100	5	35	26	48	60
Adj No. of Lanes	1	3	0	1	3	0	1	1	0	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	2	0	0	0	0	0	0
Cap, veh/h	66	1789	206	69	2106	40	165	18	124	59	109	145
Arrive On Green	0.04	0.39	0.39	0.04	0.41	0.41	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1810	4636	533	1810	5141	97	1810	194	1357	656	1211	1615
Grp Volume(v), veh/h	32	530	279	34	384	210	100	0	40	74	0	60
Grp Sat Flow(s),veh/h/ln	1810	1699	1772	1810	1696	1846	1810	0	1551	1867	0	1615
Q Serve(g_s), s	0.8	5.2	5.2	0.8	3.4	3.4	2.4	0.0	1.1	1.7	0.0	1.6
Cycle Q Clear(g_c), s	0.8	5.2	5.2	0.8	3.4	3.4	2.4	0.0	1.1	1.7	0.0	1.6
Prop In Lane	1.00		0.30	1.00		0.05	1.00		0.88	0.35		1.00
Lane Grp Cap(c), veh/h	66	1311	684	69	1389	756	165	0	141	167	0	145
V/C Ratio(X)	0.48	0.40	0.41	0.49	0.28	0.28	0.61	0.00	0.28	0.44	0.00	0.41
Avail Cap(c_a), veh/h	199	1939	1012	199	1936	1054	1192	0	1021	287	0	248
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	10.2	10.2	21.5	9.0	9.0	19.9	0.0	19.3	19.7	0.0	19.6
Incr Delay (d2), s/veh	5.4	0.7	1.4	5.3	0.4	0.7	3.6	0.0	1.1	1.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.5	2.8	0.5	1.7	1.9	1.4	0.0	0.5	1.0	0.0	0.8
LnGrp Delay(d),s/veh	26.9	10.9	11.6	26.7	9.3	9.7	23.5	0.0	20.4	21.5	0.0	21.5
LnGrp LOS	C	B	B	C	A	A	C		C	C		C
Approach Vol, veh/h		841			628			140			134	
Approach Delay, s/veh		11.8			10.4			22.6			21.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	22.6		8.1	5.7	23.7		8.1
Change Period (Y+Rc), s	5.0	* 5		4.0	4.0	5.0		4.0
Max Green Setting (Gmax), s	5.0	* 26		30.0	5.0	26.0		7.0
Max Q Clear Time (g_c+I1), s	2.8	7.2		4.4	2.8	5.4		3.7
Green Ext Time (p_c), s	1.3	10.3		0.5	0.0	8.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	0	90	499	0	229	52	1329	528	221	1317	56
Future Volume (veh/h)	98	0	90	499	0	229	52	1329	528	221	1317	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	107	0	98	542	0	249	57	1445	574	240	1432	61
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	0	166	617	0	327	80	1706	815	277	2234	95
Arrive On Green	0.08	0.00	0.10	0.18	0.00	0.21	0.04	0.34	0.34	0.16	0.45	0.45
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5002	213
Grp Volume(v), veh/h	107	0	98	542	0	249	57	1445	574	240	971	522
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1825
Q Serve(g_s), s	4.7	0.0	4.7	12.3	0.0	11.9	2.5	21.1	22.1	10.6	17.8	17.8
Cycle Q Clear(g_c), s	4.7	0.0	4.7	12.3	0.0	11.9	2.5	21.1	22.1	10.6	17.8	17.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	137	0	166	617	0	327	80	1706	815	277	1514	815
V/C Ratio(X)	0.78	0.00	0.59	0.88	0.00	0.76	0.72	0.85	0.70	0.87	0.64	0.64
Avail Cap(c_a), veh/h	266	0	355	627	0	407	115	1706	815	277	1514	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	0.0	34.3	32.0	0.0	29.9	37.8	24.7	14.8	33.0	17.2	17.2
Incr Delay (d2), s/veh	9.1	0.0	3.3	13.3	0.0	6.5	11.3	5.4	5.1	24.1	2.1	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	2.2	6.9	0.0	5.8	1.5	10.8	10.7	7.1	8.7	9.7
LnGrp Delay(d),s/veh	45.4	0.0	37.6	45.4	0.0	36.4	49.1	30.1	19.9	57.1	19.3	21.1
LnGrp LOS	D		D	D		D	D	C	B	E	B	C
Approach Vol, veh/h		205			791			2076			1733	
Approach Delay, s/veh		41.7			42.6			27.8			25.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	31.4	18.9	12.9	8.1	40.3	10.7	21.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	26.9	14.6	18.0	5.2	34.2	12.0	20.6
Max Q Clear Time (g_c+I1), s	12.6	24.1	14.3	6.7	4.5	19.8	6.7	13.9
Green Ext Time (p_c), s	0.0	2.7	0.1	1.7	0.0	13.6	0.1	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	29.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	515	15	0	201	0	6
Future Vol, veh/h	515	15	0	201	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	560	16	0	218	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	568
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	522
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	522
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	522	-	-	-
HCM Lane V/C Ratio	0.012	-	-	-
HCM Control Delay (s)	12	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	340	636	348	145	5	1025	10	363	5	5	15
Future Volume (veh/h)	5	340	636	348	145	5	1025	10	363	5	5	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1792	1810	1863	1796	1900	1827	1795	1900	1900	1900	1900
Adj Flow Rate, veh/h	6	420	0	430	179	6	1265	12	448	6	6	19
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	17	6	5	2	6	6	4	0	0	0	0	0
Cap, veh/h	11	332	285	281	580	19	890	20	763	44	10	31
Arrive On Green	0.01	0.19	0.00	0.16	0.34	0.34	0.51	0.51	0.51	0.02	0.02	0.02
Sat Flow, veh/h	1547	1792	1538	1774	1728	58	1740	40	1492	1810	402	1273
Grp Volume(v), veh/h	6	420	0	430	0	185	1265	0	460	6	0	25
Grp Sat Flow(s),veh/h/ln	1547	1792	1538	1774	0	1786	1740	0	1532	1810	0	1675
Q Serve(g_s), s	0.6	27.5	0.0	23.5	0.0	11.4	76.0	0.0	31.2	0.5	0.0	2.2
Cycle Q Clear(g_c), s	0.6	27.5	0.0	23.5	0.0	11.4	76.0	0.0	31.2	0.5	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.97	1.00		0.76
Lane Grp Cap(c), veh/h	11	332	285	281	0	600	890	0	783	44	0	41
V/C Ratio(X)	0.53	1.27	0.00	1.53	0.00	0.31	1.42	0.00	0.59	0.14	0.00	0.61
Avail Cap(c_a), veh/h	52	332	285	281	0	600	890	0	783	61	0	56
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	73.5	60.6	0.0	62.6	0.0	36.6	36.3	0.0	25.4	71.0	0.0	71.8
Incr Delay (d2), s/veh	32.7	141.6	0.0	257.0	0.0	0.3	196.3	0.0	1.1	1.4	0.0	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	26.6	0.0	31.5	0.0	5.7	84.9	0.0	13.4	0.3	0.0	1.2
LnGrp Delay(d),s/veh	106.2	202.2	0.0	319.5	0.0	36.9	232.6	0.0	26.5	72.4	0.0	85.9
LnGrp LOS	F	F		F		D	F		C	E		F
Approach Vol, veh/h		426			615			1725			31	
Approach Delay, s/veh		200.8			234.5			177.7			83.3	
Approach LOS		F			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		80.5	28.0	32.0		8.1	5.6	54.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		76.0	23.5	27.5		5.0	5.0	46.0
Max Q Clear Time (g_c+I1), s		78.0	25.5	29.5		4.2	2.6	13.4
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	192.6
HCM 2010 LOS	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	270	1180	14	180	986
Future Volume (veh/h)	34	270	1180	14	180	986
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1845	1900	1696	1827
Adj Flow Rate, veh/h	35	281	1229	15	188	1027
Adj No. of Lanes	0	0	2	0	1	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	3	3	12	4
Cap, veh/h	41	325	1446	18	248	2196
Arrive On Green	0.22	0.22	0.41	0.41	0.15	0.63
Sat Flow, veh/h	181	1449	3640	43	1616	3563
Grp Volume(v), veh/h	317	0	607	637	188	1027
Grp Sat Flow(s),veh/h/ln	1635	0	1753	1838	1616	1736
Q Serve(g_s), s	11.8	0.0	19.8	19.8	7.0	9.7
Cycle Q Clear(g_c), s	11.8	0.0	19.8	19.8	7.0	9.7
Prop In Lane	0.11	0.89		0.02	1.00	
Lane Grp Cap(c), veh/h	367	0	714	749	248	2196
V/C Ratio(X)	0.86	0.00	0.85	0.85	0.76	0.47
Avail Cap(c_a), veh/h	470	0	776	814	269	2363
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	16.9	16.9	25.5	6.0
Incr Delay (d2), s/veh	12.6	0.0	8.4	8.0	10.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	11.1	11.6	3.9	4.6
LnGrp Delay(d),s/veh	36.1	0.0	25.3	25.0	36.3	6.2
LnGrp LOS	D		C	C	D	A
Approach Vol, veh/h	317		1244			1215
Approach Delay, s/veh	36.1		25.1			10.9
Approach LOS	D		C			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.2	30.2				44.4		18.6
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	27.9				42.9		18.1
Max Q Clear Time (g_c+I1), s	9.0	21.8				11.7		13.8
Green Ext Time (p_c), s	1.0	3.9				9.7		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	226.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	5	44	0	5	5	989	274	100	1275	5
Future Vol, veh/h	0	10	5	44	0	5	5	989	274	100	1275	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	30	-	-	30	105	-	-	105	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	4	8	0	4	50
Mvmt Flow	0	11	5	48	0	5	5	1075	298	109	1386	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2154	2990	696	2151	2844	686	1391	0	0	1373	0	0
Stage 1	1606	1606	-	1235	1235	-	-	-	-	-	-	-
Stage 2	548	1384	-	916	1609	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	28	14	389	~ 28	17	395	498	-	-	506	-	-
Stage 1	112	166	-	190	251	-	-	-	-	-	-	-
Stage 2	493	213	-	297	165	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	23	11	389	~ 2	13	395	498	-	-	506	-	-
Mov Cap-2 Maneuver	23	11	-	~ 2	13	-	-	-	-	-	-	-
Stage 1	111	130	-	188	248	-	-	-	-	-	-	-
Stage 2	481	211	-	211	129	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 478.9	$ 12338.4	0	1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	498	-	-	11	389	2	395	506	-	-
HCM Lane V/C Ratio	0.011	-	-	0.988	0.014	23.913	0.014	0.215	-	-
HCM Control Delay (s)	12.3	-	-$	711.1	14.4	$ 13738.9	14.2	14.1	-	-
HCM Lane LOS	B	-	-	F	B	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	2	0	8	0	0.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	65	204	60	15	10	114	293	50	15	193	105
Future Volume (veh/h)	310	65	204	60	15	10	114	293	50	15	193	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1854	1881	1900	1874	1900	1900	1855	1900	1900	1845	1827
Adj Flow Rate, veh/h	508	107	334	98	25	16	187	480	82	25	316	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Percent Heavy Veh, %	0	0	1	0	0	0	0	2	2	0	3	4
Cap, veh/h	540	114	587	121	31	20	218	536	92	44	463	390
Arrive On Green	0.37	0.37	0.37	0.10	0.10	0.10	0.12	0.35	0.35	0.02	0.25	0.00
Sat Flow, veh/h	1471	310	1599	1251	319	204	1810	1544	264	1810	1845	1553
Grp Volume(v), veh/h	615	0	334	139	0	0	187	0	562	25	316	0
Grp Sat Flow(s),veh/h/ln	1781	0	1599	1775	0	0	1810	0	1808	1810	1845	1553
Q Serve(g_s), s	36.5	0.0	18.2	8.4	0.0	0.0	11.1	0.0	32.1	1.5	16.9	0.0
Cycle Q Clear(g_c), s	36.5	0.0	18.2	8.4	0.0	0.0	11.1	0.0	32.1	1.5	16.9	0.0
Prop In Lane	0.83		1.00	0.71		0.12	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	653	0	587	172	0	0	218	0	627	44	463	390
V/C Ratio(X)	0.94	0.00	0.57	0.81	0.00	0.00	0.86	0.00	0.90	0.57	0.68	0.00
Avail Cap(c_a), veh/h	677	0	608	293	0	0	250	0	627	85	463	390
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.4	0.0	27.7	48.3	0.0	0.0	47.1	0.0	33.8	52.7	36.9	0.0
Incr Delay (d2), s/veh	21.1	0.0	1.2	8.6	0.0	0.0	22.5	0.0	17.9	11.0	7.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.8	0.0	8.2	4.5	0.0	0.0	6.9	0.0	19.2	0.9	9.6	0.0
LnGrp Delay(d),s/veh	54.5	0.0	28.8	56.9	0.0	0.0	69.6	0.0	51.7	63.7	44.9	0.0
LnGrp LOS	D		C	E			E		D	E	D	
Approach Vol, veh/h		949			139			749			341	
Approach Delay, s/veh		45.5			56.9			56.2			46.2	
Approach LOS		D			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	42.4		44.5	17.6	31.9		15.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	37.4		41.5	15.1	27.4		18.0
Max Q Clear Time (g_c+I1), s	3.5	34.1		38.5	13.1	18.9		10.4
Green Ext Time (p_c), s	0.0	1.7		1.6	0.1	3.6		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	50.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	23	368	391	2
Future Vol, veh/h	1	11	23	368	391	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	4	3	2	0
Mvmt Flow	1	12	26	409	434	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	896	436	437	0	-	0
Stage 1	436	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.236	-	-	-
Pot Cap-1 Maneuver	313	625	1112	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	306	625	1112	-	-	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	575	-	-
HCM Lane V/C Ratio	0.023	-	0.023	-	-
HCM Control Delay (s)	8.3	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

HCM 2010 Signalized Intersection Summary
31: Taylor Road & Penryn Road (South)

01/21/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	105	286	24	245	157
Future Volume (veh/h)	9	105	286	24	245	157
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1812	1900	1863	1845
Adj Flow Rate, veh/h	10	114	311	26	266	171
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	4	2	3
Cap, veh/h	13	147	705	59	326	1306
Arrive On Green	0.10	0.10	0.43	0.43	0.18	0.71
Sat Flow, veh/h	130	1487	1650	138	1774	1845
Grp Volume(v), veh/h	125	0	0	337	266	171
Grp Sat Flow(s),veh/h/ln	1631	0	0	1788	1774	1845
Q Serve(g_s), s	3.5	0.0	0.0	6.2	6.7	1.4
Cycle Q Clear(g_c), s	3.5	0.0	0.0	6.2	6.7	1.4
Prop In Lane	0.08	0.91		0.08	1.00	
Lane Grp Cap(c), veh/h	161	0	0	764	326	1306
V/C Ratio(X)	0.78	0.00	0.00	0.44	0.81	0.13
Avail Cap(c_a), veh/h	630	0	0	764	400	1306
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	0.0	0.0	9.4	18.3	2.2
Incr Delay (d2), s/veh	7.8	0.0	0.0	1.8	10.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	3.4	4.2	0.7
LnGrp Delay(d),s/veh	28.3	0.0	0.0	11.3	28.5	2.4
LnGrp LOS	C			B	C	A
Approach Vol, veh/h	125		337			437
Approach Delay, s/veh	28.3		11.3			18.3
Approach LOS	C		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.1	24.4				37.5		9.1
Change Period (Y+Rc), s	4.5	4.5				4.5		4.5
Max Green Setting (Gmax), s	10.5	18.0				33.0		18.0
Max Q Clear Time (g_c+I1), s	8.7	8.2				3.4		5.5
Green Ext Time (p_c), s	0.2	2.2				3.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	0	390	5	0	160
Future Vol, veh/h	5	0	390	5	0	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	48	48	48	48	48	48
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	10	0	813	10	0	333

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1151	818	0	0	823	0
Stage 1	818	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	221	379	-	-	816	-
Stage 1	437	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	221	379	-	-	816	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	731	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	221	-	816	-
HCM Lane V/C Ratio	-	-	0.047	-	-	-
HCM Control Delay (s)	-	-	22.1	0	0	-
HCM Lane LOS	-	-	C	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	29	0	13	2	382	35	13	152	0
Future Vol, veh/h	0	0	1	29	0	13	2	382	35	13	152	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	51	51	51	51	51	51	51	51	51	51	51	51
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	2	0
Mvmt Flow	0	0	2	57	0	25	4	749	69	25	298	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1153	1174	298	1141	1140	783	298	0	0	818	0	0
Stage 1	349	349	-	791	791	-	-	-	-	-	-	-
Stage 2	804	825	-	350	349	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	176	193	746	179	203	397	1275	-	-	819	-	-
Stage 1	671	637	-	386	404	-	-	-	-	-	-	-
Stage 2	380	390	-	671	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	160	187	746	174	196	397	1275	-	-	819	-	-
Mov Cap-2 Maneuver	160	187	-	174	196	-	-	-	-	-	-	-
Stage 1	669	618	-	385	403	-	-	-	-	-	-	-
Stage 2	354	389	-	649	618	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	32.6	0	0.8
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1275	-	-	746	211	819	-	-
HCM Lane V/C Ratio	0.003	-	-	0.003	0.39	0.031	-	-
HCM Control Delay (s)	7.8	-	-	9.8	32.6	9.5	-	-
HCM Lane LOS	A	-	-	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.7	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	17	402	69	7	175
Future Vol, veh/h	68	17	402	69	7	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	65	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	52	52	52	52	52	52
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	131	33	773	133	13	337

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1202	839	0	0	906	0
Stage 1	839	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	206	369	-	-	759	-
Stage 1	427	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	202	369	-	-	759	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.8	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	325	369	759	-
HCM Lane V/C Ratio	-	-	0.402	0.089	0.018	-
HCM Control Delay (s)	-	-	23.3	15.7	9.8	-
HCM Lane LOS	-	-	C	C	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.3	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	21	33	455	246	1
Future Vol, veh/h	0	21	33	455	246	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	55	55	55	55
Heavy Vehicles, %	0	12	10	1	1	0
Mvmt Flow	0	38	60	827	447	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1395	448	449	0	-	0
Stage 1	448	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Critical Hdwy	6.4	6.32	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.408	2.29	-	-	-
Pot Cap-1 Maneuver	157	590	1070	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	148	590	1070	-	-	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	359	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1070	-	590	-	-
HCM Lane V/C Ratio	0.056	-	0.065	-	-
HCM Control Delay (s)	8.6	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection	
Int Delay, s/veh	17.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	149	10	5	20	88	818	5	5	650	10
Future Vol, veh/h	0	0	149	10	5	20	88	818	5	5	650	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	204	14	7	27	121	1121	7	7	890	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	890	2269	2269	1124	890	0	0	1127	0	0
Stage 1	-	-	-	1365	1365	-	-	-	-	-	-	-
Stage 2	-	-	-	904	904	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	339	25	41	246	766	-	-	627	-	-
Stage 1	0	0	-	165	217	-	-	-	-	-	-	-
Stage 2	0	0	-	306	358	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	339	~ 9	34	246	766	-	-	627	-	-
Mov Cap-2 Maneuver	-	-	-	~ 9	34	-	-	-	-	-	-	-
Stage 1	-	-	-	139	183	-	-	-	-	-	-	-
Stage 2	-	-	-	120	354	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.5	$ 721.9	1	0.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	766	-	-	339	26	627	-	-
HCM Lane V/C Ratio	0.157	-	-	0.602	1.844	0.011	-	-
HCM Control Delay (s)	10.6	-	-	30.5	$ 721.9	10.8	-	-
HCM Lane LOS	B	-	-	D	F	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-	3.7	5.8	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

37: Project Driveway East & Brace Road/Brace Rd

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	521	5	17	195	11	11
Future Vol, veh/h	521	5	17	195	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	566	5	18	212	12	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	572	0	818	569
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	249	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1001	-	346	522
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1001	-	340	522
Mov Cap-2 Maneuver	-	-	-	-	446	-
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	778	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	481	-	-	1001	-
HCM Lane V/C Ratio	0.05	-	-	0.018	-
HCM Control Delay (s)	12.9	-	-	8.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Project Driveway Option B

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	65	297	0	220	0	861	27	80	1881	55
Future Volume (vph)	0	0	65	297	0	220	0	861	27	80	1881	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1447	1770		1495		4893	1583	1736	5066	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1447	1770		1495		4893	1583	1736	5066	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	69	316	0	234	0	916	29	85	2001	59
RTOR Reduction (vph)	0	0	65	0	0	163	0	0	12	0	4	0
Lane Group Flow (vph)	0	0	4	316	0	71	0	916	17	85	2056	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			3.1	5.5		13.1		27.6	33.1	3.9	35.5	
Effective Green, g (s)			3.1	5.5		13.1		27.6	33.1	3.9	35.5	
Actuated g/C Ratio			0.05	0.09		0.23		0.48	0.57	0.07	0.61	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			77	167		337		2324	901	116	3095	
v/s Ratio Prot				c0.18				0.19	0.00	0.05	c0.41	
v/s Ratio Perm			0.00			c0.05			0.01			
v/c Ratio			0.05	1.89		0.21		0.39	0.02	0.73	0.66	
Uniform Delay, d1			26.1	26.3		18.3		9.8	5.4	26.6	7.4	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.3	423.2		0.4		0.2	0.0	18.4	0.6	
Delay (s)			26.4	449.5		18.7		10.0	5.4	45.0	8.0	
Level of Service			C	F		B		B	A	D	A	
Approach Delay (s)		26.4			266.2			9.9			9.5	
Approach LOS		C			F			A			A	

Intersection Summary			
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	11	125	170	31	25	350	1002	100	80	1956	147
Future Volume (veh/h)	72	11	125	170	31	25	350	1002	100	80	1956	147
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1785	1900	1743	1845	1863
Adj Flow Rate, veh/h	75	11	130	177	32	26	365	1044	104	83	2038	153
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	7	9	3	2
Cap, veh/h	94	129	182	201	241	210	390	2702	269	104	2184	677
Arrive On Green	0.06	0.07	0.07	0.12	0.14	0.14	0.23	0.60	0.60	0.06	0.43	0.43
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	4506	448	1660	5036	1562
Grp Volume(v), veh/h	75	11	130	177	32	26	365	752	396	83	2038	153
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1624	1705	1660	1679	1562
Q Serve(g_s), s	5.4	0.7	6.2	12.7	2.0	1.8	25.2	14.5	14.5	5.9	46.3	7.4
Cycle Q Clear(g_c), s	5.4	0.7	6.2	12.7	2.0	1.8	25.2	14.5	14.5	5.9	46.3	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	94	129	182	201	241	210	390	1948	1023	104	2184	677
V/C Ratio(X)	0.80	0.09	0.72	0.88	0.13	0.12	0.94	0.39	0.39	0.80	0.93	0.23
Avail Cap(c_a), veh/h	186	435	611	207	452	395	412	1948	1023	196	2257	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.0	51.9	54.4	51.9	45.4	45.3	45.5	12.5	12.5	55.6	32.4	21.4
Incr Delay (d2), s/veh	14.1	0.3	5.2	32.0	0.2	0.3	28.1	0.3	0.5	13.1	8.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.4	2.2	7.6	0.9	0.8	14.9	6.6	7.0	3.1	23.0	3.3
LnGrp Delay(d),s/veh	70.1	52.1	59.6	83.9	45.6	45.6	73.6	12.8	13.1	68.8	40.5	21.7
LnGrp LOS	E	D	E	F	D	D	E	B	B	E	D	C
Approach Vol, veh/h		216			235			1513			2274	
Approach Delay, s/veh		62.9			74.4			27.5			40.3	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	77.1	18.7	12.9	31.5	57.2	10.9	20.8
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	14.2	68.7	15.1	30.0	29.0	53.9	13.6	31.5
Max Q Clear Time (g_c+I1), s	7.9	16.5	14.7	8.2	27.2	48.3	7.4	4.0
Green Ext Time (p_c), s	0.1	51.0	0.0	0.8	0.2	3.9	0.1	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	20	888	2163	5
Future Vol, veh/h	0	0	20	888	2163	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	21	935	2277	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1141	2282	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	169	92	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	169	92	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	92	-	-	-	-
HCM Lane V/C Ratio	0.229	-	-	-	-
HCM Control Delay (s)	55.4	-	0	-	-
HCM Lane LOS	F	-	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	0	33	142	0	58	93	825	144	56	2070	37
Future Volume (veh/h)	13	0	33	142	0	58	93	825	144	56	2070	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	14	0	36	154	0	63	101	897	157	61	2250	40
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	30	0	95	232	0	175	129	2977	1034	85	2885	51
Arrive On Green	0.02	0.00	0.06	0.07	0.00	0.11	0.07	0.59	0.59	0.05	0.56	0.56
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5146	91
Grp Volume(v), veh/h	14	0	36	154	0	63	101	897	157	61	1481	809
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1847
Q Serve(g_s), s	0.6	0.0	1.6	3.3	0.0	2.8	4.2	6.7	2.9	2.6	25.7	25.8
Cycle Q Clear(g_c), s	0.6	0.0	1.6	3.3	0.0	2.8	4.2	6.7	2.9	2.6	25.7	25.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	30	0	95	232	0	175	129	2977	1034	85	1901	1035
V/C Ratio(X)	0.47	0.00	0.38	0.66	0.00	0.36	0.78	0.30	0.15	0.72	0.78	0.78
Avail Cap(c_a), veh/h	118	0	379	242	0	385	153	2977	1034	205	1901	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	0.0	34.0	34.3	0.0	31.0	34.3	7.9	5.0	35.3	12.9	12.9
Incr Delay (d2), s/veh	10.9	0.0	2.5	6.3	0.0	1.2	19.6	0.3	0.3	10.8	3.2	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.8	1.8	0.0	1.3	2.8	3.1	1.3	1.5	12.8	14.7
LnGrp Delay(d),s/veh	47.6	0.0	36.5	40.6	0.0	32.2	54.0	8.1	5.3	46.1	16.1	18.8
LnGrp LOS	D		D	D		C	D	A	A	D	B	B
Approach Vol, veh/h		50			217			1155			2351	
Approach Delay, s/veh		39.6			38.1			11.7			17.8	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	48.6	9.6	9.0	10.0	46.7	5.8	12.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.7	40.0	5.3	18.0	6.5	42.2	5.0	18.3
Max Q Clear Time (g_c+I1), s	4.6	8.7	5.3	3.6	6.2	27.8	2.6	4.8
Green Ext Time (p_c), s	0.0	28.2	0.0	0.4	0.0	13.7	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	107	0	0	517	0	0
Future Vol, veh/h	107	0	0	517	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	0	0	562	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	116
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	936
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	936
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	545	111	0	130	0	2110	378	322	1301	115
Future Volume (vph)	0	0	545	111	0	130	0	2110	378	322	1301	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.99	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1603	1770		1553		5085	1615	1787	5031	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1603	1770		1553		5085	1615	1787	5031	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	568	116	0	135	0	2198	394	335	1355	120
RTOR Reduction (vph)	0	0	59	0	0	99	0	0	107	0	7	0
Lane Group Flow (vph)	0	0	509	116	0	36	0	2198	287	335	1468	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			33.0	5.0		42.5		82.5	87.5	21.0	107.5	
Effective Green, g (s)			33.0	5.0		42.5		82.5	87.5	21.0	107.5	
Actuated g/C Ratio			0.21	0.03		0.27		0.52	0.55	0.13	0.67	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			331	55		413		2630	885	235	3390	
v/s Ratio Prot				c0.07				c0.43	0.01	c0.19	0.29	
v/s Ratio Perm			c0.32			0.02			0.17			
v/c Ratio			1.54	2.11		0.09		0.84	0.32	1.43	0.43	
Uniform Delay, d1			63.2	77.2		43.9		32.7	19.8	69.2	12.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			256.0	555.1		0.1		2.6	0.2	214.4	0.1	
Delay (s)			319.3	632.3		44.1		35.3	20.0	283.7	12.1	
Level of Service			F	F		D		D	B	F	B	
Approach Delay (s)		319.3			315.9			33.0			62.4	
Approach LOS		F			F			C			E	

Intersection Summary			
HCM 2000 Control Delay	87.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	159.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	545	111	0	130	0	2110	378	322	1301	115
Future Volume (vph)	0	0	545	111	0	130	0	2110	378	322	1301	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.99	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1603	1770		1553		5085	1615	1787	5031	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1603	1770		1553		5085	1615	1787	5031	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	568	116	0	135	0	2198	394	335	1355	120
RTOR Reduction (vph)	0	0	59	0	0	99	0	0	107	0	7	0
Lane Group Flow (vph)	0	0	509	116	0	36	0	2198	287	335	1468	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			33.0	5.0		42.5		82.5	87.5	21.0	107.5	
Effective Green, g (s)			33.0	5.0		42.5		82.5	87.5	21.0	107.5	
Actuated g/C Ratio			0.21	0.03		0.27		0.52	0.55	0.13	0.67	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			331	55		413		2630	885	235	3390	
v/s Ratio Prot				c0.07				c0.43	0.01	c0.19	0.29	
v/s Ratio Perm			c0.32			0.02			0.17			
v/c Ratio			1.54	2.11		0.09		0.84	0.32	1.43	0.43	
Uniform Delay, d1			63.2	77.2		43.9		32.7	19.8	69.2	12.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			256.0	555.1		0.1		2.6	0.2	214.4	0.1	
Delay (s)			319.3	632.3		44.1		35.3	20.0	283.7	12.1	
Level of Service			F	F		D		D	B	F	B	
Approach Delay (s)		319.3			315.9			33.0			62.4	
Approach LOS		F			F			C			E	

Intersection Summary			
HCM 2000 Control Delay	87.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	159.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	2488	1927	5
Future Vol, veh/h	0	20	5	2488	1927	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	2565	1987	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	996	1992	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.2	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.95	3.1	-	-	-
Pot Cap-1 Maneuver	0	204	129	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	204	129	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	129	-	204	-	-
HCM Lane V/C Ratio	0.04	-	0.101	-	-
HCM Control Delay (s)	34.1	-	24.6	-	-
HCM Lane LOS	D	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	0	83	370	0	167	48	2227	356	148	1739	60
Future Volume (veh/h)	105	0	83	370	0	167	48	2227	356	148	1739	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	114	0	90	402	0	182	52	2421	387	161	1890	65
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	0	132	455	0	216	67	2658	1037	191	2991	103
Arrive On Green	0.08	0.00	0.08	0.13	0.00	0.14	0.04	0.52	0.52	0.11	0.59	0.59
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5049	173
Grp Volume(v), veh/h	114	0	90	402	0	182	52	2421	387	161	1268	687
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1832
Q Serve(g_s), s	7.4	0.0	6.4	13.4	0.0	13.1	3.4	50.6	13.0	10.4	28.4	28.5
Cycle Q Clear(g_c), s	7.4	0.0	6.4	13.4	0.0	13.1	3.4	50.6	13.0	10.4	28.4	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	140	0	132	455	0	216	67	2658	1037	191	2009	1086
V/C Ratio(X)	0.81	0.00	0.68	0.88	0.00	0.84	0.78	0.91	0.37	0.84	0.63	0.63
Avail Cap(c_a), veh/h	184	0	244	457	0	291	143	2658	1037	297	2009	1086
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	0.0	52.0	49.7	0.0	49.1	55.6	25.4	9.2	51.1	15.5	15.5
Incr Delay (d2), s/veh	18.6	0.0	6.1	18.2	0.0	15.2	17.1	6.0	1.0	12.3	1.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	3.0	7.5	0.0	6.6	2.0	25.0	5.9	5.7	13.6	15.2
LnGrp Delay(d),s/veh	71.5	0.0	58.1	67.9	0.0	64.3	72.7	31.4	10.2	63.3	17.0	18.3
LnGrp LOS	E		E	E		E	E	C	B	E	B	B
Approach Vol, veh/h		204			584			2860			2116	
Approach Delay, s/veh		65.6			66.8			29.3			20.9	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	65.5	19.9	14.2	8.9	73.6	13.7	20.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	19.5	59.0	15.5	18.0	9.4	69.1	12.1	21.4
Max Q Clear Time (g_c+I1), s	12.4	52.6	15.4	8.4	5.4	30.5	9.4	15.1
Green Ext Time (p_c), s	0.2	6.4	0.0	1.1	0.0	37.9	0.1	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	31.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	693	7	0	236	0	3
Future Vol, veh/h	693	7	0	236	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	753	8	0	257	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	757
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	408
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	408
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	408	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	13.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

01/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	270	127	0	80	0	1376	286	250	1209	110
Future Volume (vph)	0	0	270	127	0	80	0	1376	286	250	1209	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1601	1805		1455		5036	1599	1752	5030	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1601	1805		1455		5036	1599	1752	5030	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	281	132	0	83	0	1433	298	260	1259	115
RTOR Reduction (vph)	0	0	104	0	0	63	0	0	148	0	11	0
Lane Group Flow (vph)	0	0	177	132	0	20	0	1433	150	260	1363	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			13.1	5.0		22.6		41.8	46.8	15.1	60.9	
Effective Green, g (s)			13.1	5.0		22.6		41.8	46.8	15.1	60.9	
Actuated g/C Ratio			0.14	0.05		0.24		0.45	0.50	0.16	0.65	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			225	97		353		2263	804	284	3293	
v/s Ratio Prot				c0.07				c0.28	0.01	c0.15	0.27	
v/s Ratio Perm			c0.11			0.01			0.08			
v/c Ratio			0.79	1.36		0.06		0.63	0.19	0.92	0.41	
Uniform Delay, d1			38.6	44.0		27.0		19.7	12.7	38.3	7.6	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			16.4	215.2		0.1		0.7	0.1	31.5	0.1	
Delay (s)			55.0	259.2		27.1		20.4	12.8	69.8	7.7	
Level of Service			E	F		C		C	B	E	A	
Approach Delay (s)		55.0			169.6			19.1			17.6	
Approach LOS		E			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	24	210	196	34	65	210	1455	144	100	1452	203
Future Volume (veh/h)	294	24	210	196	34	65	210	1455	144	100	1452	203
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1864	1900	1845	1863	1881
Adj Flow Rate, veh/h	306	25	219	204	35	68	219	1516	150	104	1512	211
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	1
Cap, veh/h	344	243	370	243	129	119	256	2150	213	132	1955	606
Arrive On Green	0.20	0.13	0.13	0.14	0.07	0.07	0.15	0.46	0.46	0.07	0.38	0.38
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4709	466	1757	5085	1577
Grp Volume(v), veh/h	306	25	219	204	35	68	219	1092	574	104	1512	211
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1697	1782	1757	1695	1577
Q Serve(g_s), s	14.8	1.0	6.4	9.8	1.6	3.5	10.6	22.2	22.3	5.0	22.4	8.2
Cycle Q Clear(g_c), s	14.8	1.0	6.4	9.8	1.6	3.5	10.6	22.2	22.3	5.0	22.4	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	344	243	370	243	129	119	256	1549	813	132	1955	606
V/C Ratio(X)	0.89	0.10	0.59	0.84	0.27	0.57	0.86	0.71	0.71	0.79	0.77	0.35
Avail Cap(c_a), veh/h	408	691	1054	359	612	562	299	1559	819	167	1955	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	32.9	35.2	36.2	37.8	38.6	35.9	18.8	18.8	39.2	23.2	18.8
Incr Delay (d2), s/veh	18.5	0.2	1.5	10.8	1.1	4.3	19.0	1.9	3.5	17.7	2.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	0.5	2.5	5.4	0.8	1.7	6.5	10.7	11.6	3.1	10.9	3.7
LnGrp Delay(d),s/veh	52.1	33.0	36.7	47.0	38.9	42.9	54.8	20.6	22.3	56.9	25.6	19.6
LnGrp LOS	D	C	D	D	D	D	D	C	C	E	C	B
Approach Vol, veh/h		550			307			1885			1827	
Approach Delay, s/veh		45.1			45.2			25.1			26.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	44.3	15.9	15.5	16.7	38.1	21.1	10.3
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.2	39.6	17.6	32.6	14.8	33.0	20.2	30.0
Max Q Clear Time (g_c+I1), s	7.0	24.3	11.8	8.4	12.6	24.4	16.8	5.5
Green Ext Time (p_c), s	0.0	15.1	0.3	1.4	0.1	8.5	0.3	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	10	1662	1606	0
Future Vol, veh/h	0	0	10	1662	1606	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	10	1713	1656	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	828	1656	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	273	190	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	273	190	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	190	-	-	-	-
HCM Lane V/C Ratio	0.054	-	-	-	-
HCM Control Delay (s)	25	-	0	-	-
HCM Lane LOS	D	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	0	90	439	0	241	52	1329	465	233	1317	56
Future Volume (veh/h)	98	0	90	439	0	241	52	1329	465	233	1317	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	107	0	98	477	0	262	57	1445	505	253	1432	61
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	0	173	552	0	305	76	1835	825	294	2422	103
Arrive On Green	0.08	0.00	0.11	0.16	0.00	0.19	0.04	0.36	0.36	0.17	0.48	0.48
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5002	213
Grp Volume(v), veh/h	107	0	98	477	0	262	57	1445	505	253	971	522
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1825
Q Serve(g_s), s	5.2	0.0	5.2	11.9	0.0	14.2	2.8	22.4	19.8	12.3	18.3	18.3
Cycle Q Clear(g_c), s	5.2	0.0	5.2	11.9	0.0	14.2	2.8	22.4	19.8	12.3	18.3	18.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	137	0	173	552	0	305	76	1835	825	294	1641	884
V/C Ratio(X)	0.78	0.00	0.57	0.86	0.00	0.86	0.75	0.79	0.61	0.86	0.59	0.59
Avail Cap(c_a), veh/h	253	0	322	588	0	367	122	1835	825	431	1641	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	37.4	36.2	0.0	34.5	41.9	25.2	14.9	35.9	16.5	16.5
Incr Delay (d2), s/veh	9.4	0.0	2.9	12.1	0.0	15.8	14.0	3.5	3.4	11.2	1.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	2.4	6.6	0.0	7.5	1.7	11.0	9.4	6.9	8.9	9.9
LnGrp Delay(d),s/veh	49.5	0.0	40.3	48.3	0.0	50.3	55.9	28.7	18.2	47.1	18.1	19.4
LnGrp LOS	D		D	D		D	E	C	B	D	B	B
Approach Vol, veh/h		205			739			2007			1746	
Approach Delay, s/veh		45.1			49.0			26.9			22.7	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	36.4	18.7	14.2	8.3	47.3	11.3	21.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.5	27.4	15.1	18.0	6.1	42.8	12.6	20.5
Max Q Clear Time (g_c+I1), s	14.3	24.4	13.9	7.2	4.8	20.3	7.2	16.2
Green Ext Time (p_c), s	0.4	2.9	0.2	1.7	0.0	20.6	0.1	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	29.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	521	15	0	207	0	6
Future Vol, veh/h	521	15	0	207	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	566	16	0	225	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	574
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	518
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	518
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	518	-	-	-
HCM Lane V/C Ratio	0.013	-	-	-
HCM Control Delay (s)	12	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Project Driveway Option C

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	65	295	0	222	0	859	25	80	1881	55
Future Volume (vph)	0	0	65	295	0	222	0	859	25	80	1881	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.97	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1432	1770		1495		4893	1583	1736	5066	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1432	1770		1495		4893	1583	1736	5066	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	0	69	314	0	236	0	914	27	85	2001	59
RTOR Reduction (vph)	0	0	67	0	0	159	0	0	10	0	5	0
Lane Group Flow (vph)	0	0	2	314	0	77	0	914	17	85	2055	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	11%	2%	0%	8%	0%	6%	2%	4%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			1.7	13.1		19.3		23.2	36.3	3.3	30.5	
Effective Green, g (s)			1.7	13.1		19.3		23.2	36.3	3.3	30.5	
Actuated g/C Ratio			0.03	0.22		0.33		0.39	0.61	0.06	0.51	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			41	391		486		1914	969	96	2605	
v/s Ratio Prot				c0.18				0.19	0.00	0.05	c0.41	
v/s Ratio Perm			0.00			c0.05			0.01			
v/c Ratio			0.05	0.80		0.16		0.48	0.02	0.89	0.79	
Uniform Delay, d1			28.0	21.9		14.2		13.5	4.5	27.8	11.8	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.5	11.3		0.2		0.3	0.0	55.0	1.8	
Delay (s)			28.5	33.2		14.4		13.8	4.5	82.8	13.5	
Level of Service			C	C		B		B	A	F	B	
Approach Delay (s)		28.5			25.1			13.5			16.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

08/19/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	11	125	170	31	25	350	1002	100	80	1956	147
Future Volume (veh/h)	72	11	125	170	31	25	350	1002	100	80	1956	147
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1727	1776	1792	1785	1900	1743	1845	1863
Adj Flow Rate, veh/h	75	11	130	177	32	26	365	1044	104	83	2038	153
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	7	6	7	7	9	3	2
Cap, veh/h	94	129	182	201	241	210	390	2702	269	104	2184	677
Arrive On Green	0.06	0.07	0.07	0.12	0.14	0.14	0.23	0.60	0.60	0.06	0.43	0.43
Sat Flow, veh/h	1645	1743	2450	1645	1727	1509	1707	4505	448	1660	5036	1562
Grp Volume(v), veh/h	75	11	130	177	32	26	365	752	396	83	2038	153
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1645	1727	1509	1707	1624	1705	1660	1679	1562
Q Serve(g_s), s	5.4	0.7	6.2	12.7	2.0	1.8	25.2	14.5	14.5	5.9	46.3	7.4
Cycle Q Clear(g_c), s	5.4	0.7	6.2	12.7	2.0	1.8	25.2	14.5	14.5	5.9	46.3	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	94	129	182	201	241	210	390	1948	1023	104	2184	677
V/C Ratio(X)	0.80	0.09	0.72	0.88	0.13	0.12	0.94	0.39	0.39	0.80	0.93	0.23
Avail Cap(c_a), veh/h	186	435	611	207	452	395	412	1948	1023	196	2257	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.0	51.9	54.4	51.9	45.4	45.3	45.5	12.5	12.5	55.6	32.4	21.4
Incr Delay (d2), s/veh	14.1	0.3	5.2	32.0	0.2	0.3	28.1	0.3	0.5	13.1	8.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.4	2.2	7.6	0.9	0.8	14.9	6.6	7.0	3.1	23.0	3.3
LnGrp Delay(d),s/veh	70.1	52.1	59.6	83.9	45.6	45.6	73.6	12.8	13.1	68.8	40.5	21.7
LnGrp LOS	E	D	E	F	D	D	E	B	B	E	D	C
Approach Vol, veh/h		216			235			1513			2274	
Approach Delay, s/veh		62.9			74.4			27.5			40.3	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	77.1	18.7	12.9	31.5	57.2	10.9	20.8
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	14.2	68.7	15.1	30.0	29.0	53.9	13.6	31.5
Max Q Clear Time (g_c+I1), s	7.9	16.5	14.7	8.2	27.2	48.3	7.4	4.0
Green Ext Time (p_c), s	0.1	51.0	0.0	0.8	0.2	3.9	0.1	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	20	884	2161	5
Future Vol, veh/h	0	0	20	884	2161	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	0	0	21	931	2275	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1140	2280	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	170	92	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	170	92	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	92	-	-	-	-
HCM Lane V/C Ratio	0.229	-	-	-	-
HCM Control Delay (s)	55.4	-	0	-	-
HCM Lane LOS	F	-	A	-	-
HCM 95th %tile Q(veh)	0.8	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	0	33	142	0	54	93	825	144	54	2070	37
Future Volume (veh/h)	13	0	33	142	0	54	93	825	144	54	2070	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	14	0	36	154	0	59	101	897	157	59	2250	40
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	30	0	95	233	0	175	129	2977	1034	84	2881	51
Arrive On Green	0.02	0.00	0.06	0.07	0.00	0.11	0.07	0.59	0.59	0.05	0.56	0.56
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5146	91
Grp Volume(v), veh/h	14	0	36	154	0	59	101	897	157	59	1481	809
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1847
Q Serve(g_s), s	0.6	0.0	1.6	3.3	0.0	2.6	4.2	6.7	2.9	2.5	25.6	25.7
Cycle Q Clear(g_c), s	0.6	0.0	1.6	3.3	0.0	2.6	4.2	6.7	2.9	2.5	25.6	25.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	30	0	95	233	0	175	129	2977	1034	84	1898	1034
V/C Ratio(X)	0.47	0.00	0.38	0.66	0.00	0.34	0.78	0.30	0.15	0.71	0.78	0.78
Avail Cap(c_a), veh/h	118	0	380	252	0	391	154	2977	1034	173	1898	1034
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	0.0	33.9	34.1	0.0	30.8	34.2	7.8	5.0	35.2	12.9	12.9
Incr Delay (d2), s/veh	10.9	0.0	2.5	5.7	0.0	1.1	19.5	0.3	0.3	10.3	3.3	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.8	1.7	0.0	1.2	2.7	3.1	1.3	1.4	12.8	14.7
LnGrp Delay(d),s/veh	47.5	0.0	36.4	39.8	0.0	31.9	53.7	8.1	5.3	45.5	16.2	18.8
LnGrp LOS	D		D	D		C	D	A	A	D	B	B
Approach Vol, veh/h		50			213			1155			2349	
Approach Delay, s/veh		39.5			37.6			11.7			17.8	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	48.4	9.6	9.0	9.9	46.5	5.8	12.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.3	41.2	5.5	18.0	6.5	42.0	5.0	18.5
Max Q Clear Time (g_c+I1), s	4.5	8.7	5.3	3.6	6.2	27.7	2.6	4.6
Green Ext Time (p_c), s	0.0	29.2	0.0	0.4	0.0	13.5	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	0	0	517	0	0
Future Vol, veh/h	105	0	0	517	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	0	0	562	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	114
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	939
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	939
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	0	-	-	-
HCM Lane LOS	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	1	3	515	5	4
Future Vol, veh/h	105	1	3	515	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	260	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	1	3	560	5	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	115	0	681	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1474	-	416	937
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1474	-	415	937
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	567	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	617	-	-	1474	-
HCM Lane V/C Ratio	0.016	-	-	0.002	-
HCM Control Delay (s)	10.9	-	-	7.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	545	105	0	133	0	2107	375	322	1301	115
Future Volume (vph)	0	0	545	105	0	133	0	2107	375	322	1301	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.99	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1604	1770		1553		5085	1615	1787	5031	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1604	1770		1553		5085	1615	1787	5031	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	568	109	0	139	0	2195	391	335	1355	120
RTOR Reduction (vph)	0	0	70	0	0	93	0	0	131	0	8	0
Lane Group Flow (vph)	0	0	498	109	0	46	0	2195	260	335	1467	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	2%	0%	4%	0%	2%	0%	1%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			31.0	7.5		43.0		52.5	60.0	21.0	77.5	
Effective Green, g (s)			31.0	7.5		43.0		52.5	60.0	21.0	77.5	
Actuated g/C Ratio			0.24	0.06		0.33		0.40	0.46	0.16	0.60	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			382	102		513		2053	745	288	2999	
v/s Ratio Prot				c0.06				c0.43	0.02	c0.19	0.29	
v/s Ratio Perm			c0.31			0.03			0.14			
v/c Ratio			1.30	1.07		0.09		1.07	0.35	1.16	0.49	
Uniform Delay, d1			49.5	61.2		30.0		38.8	22.5	54.5	15.0	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			154.5	108.8		0.1		41.3	0.3	104.7	0.2	
Delay (s)			204.0	170.1		30.1		80.1	22.7	159.2	15.1	
Level of Service			F	F		C		F	C	F	B	
Approach Delay (s)		204.0			91.6			71.4			41.8	
Approach LOS		F			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	76.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	27	285	150	32	90	220	2121	84	100	1831	192
Future Volume (veh/h)	422	27	285	150	32	90	220	2121	84	100	1831	192
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1900	1863	1863	1881
Adj Flow Rate, veh/h	449	29	303	160	34	96	234	2256	89	106	1948	204
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	1
Cap, veh/h	429	403	603	188	165	138	232	2382	94	112	2051	636
Arrive On Green	0.24	0.22	0.22	0.11	0.09	0.09	0.13	0.47	0.47	0.06	0.40	0.40
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	5021	197	1774	5085	1577
Grp Volume(v), veh/h	449	29	303	160	34	96	234	1520	825	106	1948	204
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1695	1828	1774	1695	1577
Q Serve(g_s), s	30.0	1.6	12.3	11.3	2.2	7.7	17.0	54.0	54.7	7.5	46.8	11.2
Cycle Q Clear(g_c), s	30.0	1.6	12.3	11.3	2.2	7.7	17.0	54.0	54.7	7.5	46.8	11.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	429	403	603	188	165	138	232	1609	867	112	2051	636
V/C Ratio(X)	1.05	0.07	0.50	0.85	0.21	0.70	1.01	0.94	0.95	0.94	0.95	0.32
Avail Cap(c_a), veh/h	429	548	819	307	433	361	232	1609	867	112	2051	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	39.0	43.2	55.5	53.3	55.8	54.7	31.6	31.8	59.0	36.5	25.9
Incr Delay (d2), s/veh	55.9	0.1	0.6	11.6	0.6	6.2	61.7	12.1	20.1	67.3	10.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.6	0.8	4.7	6.1	1.1	3.5	12.0	27.8	32.3	5.8	23.8	5.0
LnGrp Delay(d),s/veh	104.1	39.1	43.8	67.1	53.9	62.0	116.5	43.7	51.9	126.3	47.1	26.5
LnGrp LOS	F	D	D	E	D	E	F	D	D	F	D	C
Approach Vol, veh/h		781			290			2579			2258	
Approach Delay, s/veh		78.3			63.9			53.0			49.0	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	65.0	17.5	31.9	21.0	56.0	34.0	15.4
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	60.0	22.1	37.9	17.0	51.0	30.0	30.0
Max Q Clear Time (g_c+I1), s	9.5	56.7	13.3	14.3	19.0	48.8	32.0	9.7
Green Ext Time (p_c), s	0.0	3.3	0.3	1.9	0.0	2.2	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	55.3
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	5	2482	1921	5
Future Vol, veh/h	0	20	5	2482	1921	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	5	0	2	2	50
Mvmt Flow	0	21	5	2559	1980	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	993	1985	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.2	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.95	3.1	-	-	-
Pot Cap-1 Maneuver	0	205	130	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	205	130	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.5	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	130	-	205	-	-
HCM Lane V/C Ratio	0.04	-	0.101	-	-
HCM Control Delay (s)	33.8	-	24.5	-	-
HCM Lane LOS	D	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	0	83	370	0	161	48	2227	356	142	1739	60
Future Volume (veh/h)	105	0	83	370	0	161	48	2227	356	142	1739	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	114	0	90	402	0	175	52	2421	387	154	1890	65
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	141	0	132	449	0	212	67	2679	1040	174	2964	102
Arrive On Green	0.08	0.00	0.08	0.13	0.00	0.13	0.04	0.53	0.53	0.10	0.59	0.59
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5049	173
Grp Volume(v), veh/h	114	0	90	402	0	175	52	2421	387	154	1268	687
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1832
Q Serve(g_s), s	7.0	0.0	6.1	12.8	0.0	12.0	3.2	47.8	12.3	9.5	27.5	27.5
Cycle Q Clear(g_c), s	7.0	0.0	6.1	12.8	0.0	12.0	3.2	47.8	12.3	9.5	27.5	27.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	141	0	132	449	0	212	67	2679	1040	174	1990	1075
V/C Ratio(X)	0.81	0.00	0.68	0.90	0.00	0.82	0.78	0.90	0.37	0.89	0.64	0.64
Avail Cap(c_a), veh/h	179	0	256	449	0	303	145	2679	1040	174	1990	1075
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	0.0	49.6	47.6	0.0	46.9	53.1	23.8	8.7	49.6	15.2	15.2
Incr Delay (d2), s/veh	19.4	0.0	6.1	20.2	0.0	11.6	17.2	5.6	1.0	38.0	1.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	2.9	7.3	0.0	5.9	1.9	23.6	5.7	6.5	13.1	14.6
LnGrp Delay(d),s/veh	69.8	0.0	55.7	67.9	0.0	58.5	70.2	29.4	9.7	87.5	16.7	18.1
LnGrp LOS	E		E	E		E	E	C	A	F	B	B
Approach Vol, veh/h		204			577			2860			2109	
Approach Delay, s/veh		63.6			65.0			27.4			22.3	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	63.1	19.0	13.7	8.7	69.8	13.3	19.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.9	58.6	14.5	18.0	9.1	60.4	11.2	21.3
Max Q Clear Time (g_c+I1), s	11.5	49.8	14.8	8.1	5.2	29.5	9.0	14.0
Green Ext Time (p_c), s	0.0	8.7	0.0	1.1	0.0	30.4	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	690	7	0	233	0	3
Future Vol, veh/h	690	7	0	233	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	750	8	0	253	0	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	754
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	409
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	409
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	409	-	-	-
HCM Lane V/C Ratio	0.008	-	-	-
HCM Control Delay (s)	13.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	693	5	11	230	6	6
Future Vol, veh/h	693	5	11	230	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	260	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	753	5	12	250	7	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	759	0	1030	756
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	852	-	259	408
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	852	-	255	408
Mov Cap-2 Maneuver	-	-	-	-	368	-
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	761	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	387	-	-	852	-
HCM Lane V/C Ratio	0.034	-	-	0.014	-
HCM Control Delay (s)	14.6	-	-	9.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM Signalized Intersection Capacity Analysis
7: Sierra College Blvd & Brace Rd

07/12/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	270	115	0	86	0	1370	280	250	1209	110
Future Volume (vph)	0	0	270	115	0	86	0	1370	280	250	1209	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Lane Util. Factor			1.00	1.00		1.00		0.91	1.00	1.00	0.91	
Frpb, ped/bikes			0.98	1.00		1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Frt			0.86	1.00		0.85		1.00	0.85	1.00	0.99	
Flt Protected			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)			1599	1805		1455		5036	1599	1752	5030	
Flt Permitted			1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)			1599	1805		1455		5036	1599	1752	5030	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	281	120	0	90	0	1427	292	260	1259	115
RTOR Reduction (vph)	0	0	165	0	0	66	0	0	161	0	16	0
Lane Group Flow (vph)	0	0	116	120	0	24	0	1427	131	260	1358	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	0%	1%	0%	0%	11%	0%	3%	1%	3%	2%	0%
Turn Type			Perm	Prot		Perm		NA	pm+ov	Prot	NA	
Protected Phases				3				6	3	5	2	
Permitted Phases			4			8			6			
Actuated Green, G (s)			7.0	5.5		17.0		23.5	29.0	10.5	38.0	
Effective Green, g (s)			7.0	5.5		17.0		23.5	29.0	10.5	38.0	
Actuated g/C Ratio			0.11	0.09		0.26		0.36	0.45	0.16	0.59	
Clearance Time (s)			4.0	4.5		4.0		5.5	4.5	4.0	5.5	
Vehicle Extension (s)			3.0	3.0		4.0		4.0	3.0	0.5	4.0	
Lane Grp Cap (vph)			173	153		383		1834	718	285	2963	
v/s Ratio Prot				c0.07				c0.28	0.02	c0.15	0.27	
v/s Ratio Perm			c0.07			0.02			0.07			
v/c Ratio			0.67	0.78		0.06		0.78	0.18	0.91	0.46	
Uniform Delay, d1			27.6	28.9		17.8		18.2	10.6	26.5	7.5	
Progression Factor			1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2			9.8	22.6		0.1		2.3	0.1	30.9	0.2	
Delay (s)			37.4	51.5		17.9		20.5	10.8	57.4	7.6	
Level of Service			D	D		B		C	B	E	A	
Approach Delay (s)		37.4			37.1			18.8			15.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	24	210	196	34	65	210	1455	144	100	1452	203
Future Volume (veh/h)	294	24	210	196	34	65	210	1455	144	100	1452	203
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1864	1900	1845	1863	1881
Adj Flow Rate, veh/h	306	25	219	204	35	68	219	1516	150	104	1512	211
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	1
Cap, veh/h	344	243	370	243	129	119	256	2150	213	132	1955	606
Arrive On Green	0.20	0.13	0.13	0.14	0.07	0.07	0.15	0.46	0.46	0.07	0.38	0.38
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4709	466	1757	5085	1577
Grp Volume(v), veh/h	306	25	219	204	35	68	219	1092	574	104	1512	211
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1697	1782	1757	1695	1577
Q Serve(g_s), s	14.8	1.0	6.4	9.8	1.6	3.5	10.6	22.2	22.3	5.0	22.4	8.2
Cycle Q Clear(g_c), s	14.8	1.0	6.4	9.8	1.6	3.5	10.6	22.2	22.3	5.0	22.4	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	344	243	370	243	129	119	256	1549	813	132	1955	606
V/C Ratio(X)	0.89	0.10	0.59	0.84	0.27	0.57	0.86	0.71	0.71	0.79	0.77	0.35
Avail Cap(c_a), veh/h	408	691	1054	359	612	562	299	1559	819	167	1955	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	32.9	35.2	36.2	37.8	38.6	35.9	18.8	18.8	39.2	23.2	18.8
Incr Delay (d2), s/veh	18.5	0.2	1.5	10.8	1.1	4.3	19.0	1.9	3.5	17.7	2.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	0.5	2.5	5.4	0.8	1.7	6.5	10.7	11.6	3.1	10.9	3.7
LnGrp Delay(d),s/veh	52.1	33.0	36.7	47.0	38.9	42.9	54.8	20.6	22.3	56.9	25.6	19.6
LnGrp LOS	D	C	D	D	D	D	D	C	C	E	C	B
Approach Vol, veh/h		550			307			1885			1827	
Approach Delay, s/veh		45.1			45.2			25.1			26.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	44.3	15.9	15.5	16.7	38.1	21.1	10.3
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.2	39.6	17.6	32.6	14.8	33.0	20.2	30.0
Max Q Clear Time (g_c+I1), s	7.0	24.3	11.8	8.4	12.6	24.4	16.8	5.5
Green Ext Time (p_c), s	0.0	15.1	0.3	1.4	0.1	8.5	0.3	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	29.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	10	1650	1594	0
Future Vol, veh/h	0	0	10	1650	1594	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	95	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	10	1701	1643	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	822	1643	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	276	193	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	276	193	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	193	-	-	-	-
HCM Lane V/C Ratio	0.053	-	-	-	-
HCM Control Delay (s)	24.7	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	0	90	439	0	229	52	1329	465	221	1317	56
Future Volume (veh/h)	98	0	90	439	0	229	52	1329	465	221	1317	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	107	0	98	477	0	249	57	1445	505	240	1432	61
Adj No. of Lanes	1	1	0	2	1	0	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	138	0	167	560	0	302	80	1761	806	279	2292	98
Arrive On Green	0.08	0.00	0.11	0.16	0.00	0.19	0.05	0.35	0.35	0.16	0.46	0.46
Sat Flow, veh/h	1774	0	1583	3442	0	1583	1774	5085	1583	1774	5002	213
Grp Volume(v), veh/h	107	0	98	477	0	249	57	1445	505	240	971	522
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1721	0	1583	1774	1695	1583	1774	1695	1825
Q Serve(g_s), s	4.7	0.0	4.7	10.6	0.0	11.9	2.5	20.5	18.1	10.4	17.1	17.1
Cycle Q Clear(g_c), s	4.7	0.0	4.7	10.6	0.0	11.9	2.5	20.5	18.1	10.4	17.1	17.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	138	0	167	560	0	302	80	1761	806	279	1553	836
V/C Ratio(X)	0.78	0.00	0.59	0.85	0.00	0.82	0.71	0.82	0.63	0.86	0.62	0.62
Avail Cap(c_a), veh/h	270	0	362	594	0	394	117	1761	806	295	1553	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	0.0	33.6	32.1	0.0	30.6	37.1	23.5	14.0	32.4	16.2	16.2
Incr Delay (d2), s/veh	9.0	0.0	3.2	11.0	0.0	10.5	11.0	4.4	3.7	21.2	1.9	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	2.2	5.9	0.0	6.1	1.5	10.2	8.6	6.7	8.4	9.4
LnGrp Delay(d),s/veh	44.7	0.0	36.9	43.0	0.0	41.1	48.1	28.0	17.6	53.6	18.1	19.7
LnGrp LOS	D		D	D		D	D	C	B	D	B	B
Approach Vol, veh/h		205			726			2007			1733	
Approach Delay, s/veh		41.0			42.4			25.9			23.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	31.8	17.3	12.8	8.1	40.6	10.6	19.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.1	27.3	13.6	18.0	5.2	35.2	12.0	19.6
Max Q Clear Time (g_c+I1), s	12.4	22.5	12.6	6.7	4.5	19.1	6.7	13.9
Green Ext Time (p_c), s	0.1	4.7	0.2	1.7	0.0	15.0	0.1	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	515	15	0	201	0	6
Future Vol, veh/h	515	15	0	201	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	560	16	0	218	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	568
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	522
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	522
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	522	-	-	-
HCM Lane V/C Ratio	0.012	-	-	-
HCM Control Delay (s)	12	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	521	5	17	195	11	11
Future Vol, veh/h	521	5	17	195	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	260	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	566	5	18	212	12	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	572	0	818	569
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	249	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1001	-	346	522
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1001	-	340	522
Mov Cap-2 Maneuver	-	-	-	-	446	-
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	778	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	481	-	-	1001	-
HCM Lane V/C Ratio	0.05	-	-	0.018	-
HCM Control Delay (s)	12.9	-	-	8.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Existing Plus Project with Mitigation Conditions

Project Driveway Option A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	79	114	175	109	242	348
Future Volume (veh/h)	79	114	175	109	242	348
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1810	1827
Adj Flow Rate, veh/h	111	161	246	154	341	490
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Percent Heavy Veh, %	0	0	4	4	5	4
Cap, veh/h	140	203	631	395	611	1088
Arrive On Green	0.20	0.20	0.60	0.60	0.60	0.60
Sat Flow, veh/h	687	997	1060	664	953	1827
Grp Volume(v), veh/h	273	0	0	400	341	490
Grp Sat Flow(s),veh/h/ln	1690	0	0	1723	953	1827
Q Serve(g_s), s	6.9	0.0	0.0	5.5	13.2	6.7
Cycle Q Clear(g_c), s	6.9	0.0	0.0	5.5	18.7	6.7
Prop In Lane	0.41	0.59		0.38	1.00	
Lane Grp Cap(c), veh/h	345	0	0	1027	611	1088
V/C Ratio(X)	0.79	0.00	0.00	0.39	0.56	0.45
Avail Cap(c_a), veh/h	681	0	0	1262	742	1338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	0.0	4.8	9.7	5.0
Incr Delay (d2), s/veh	4.1	0.0	0.0	0.2	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	2.6	3.5	3.4
LnGrp Delay(d),s/veh	21.1	0.0	0.0	5.0	10.5	5.3
LnGrp LOS	C			A	B	A
Approach Vol, veh/h	273		400			831
Approach Delay, s/veh	21.1		5.0			7.4
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		31.3				31.3		13.7
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		32.9				32.9		18.1
Max Q Clear Time (g_c+I1), s		7.5				20.7		8.9
Green Ext Time (p_c), s		8.8				6.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	291	252	81	251	0	498	0	133	0	0	0
Future Volume (veh/h)	1	291	252	81	251	0	498	0	133	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1776	1845	1776	1792	1900	1900	1810	1827	1900	1900	1900
Adj Flow Rate, veh/h	1	303	0	84	261	0	519	0	139	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	3	7	6	6	0	0	4	0	0	0
Cap, veh/h	113	530	468	580	535	0	727	0	655	0	6	0
Arrive On Green	0.30	0.30	0.00	0.30	0.30	0.00	0.42	0.00	0.42	0.00	0.00	0.00
Sat Flow, veh/h	1	1774	1568	1022	1792	0	1723	0	1553	0	1900	0
Grp Volume(v), veh/h	304	0	0	84	261	0	519	0	139	0	0	0
Grp Sat Flow(s),veh/h/ln	1775	0	1568	1022	1792	0	1723	0	1553	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	3.8	0.0	8.0	0.0	1.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.7	0.0	0.0	1.5	3.8	0.0	8.0	0.0	1.8	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	642	0	468	580	535	0	727	0	655	0	6	0
V/C Ratio(X)	0.47	0.00	0.00	0.14	0.49	0.00	0.71	0.00	0.21	0.00	0.00	0.00
Avail Cap(c_a), veh/h	1111	0	882	850	1009	0	1361	0	1226	0	1063	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	9.5	0.0	0.0	8.4	9.3	0.0	7.7	0.0	5.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.1	0.7	0.0	1.3	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	0.6	2.0	0.0	4.0	0.0	0.8	0.0	0.0	0.0
LnGrp Delay(d),s/veh	10.1	0.0	0.0	8.5	9.9	0.0	9.0	0.0	6.1	0.0	0.0	0.0
LnGrp LOS	B			A	A		A		A			
Approach Vol, veh/h		304			345			658			0	
Approach Delay, s/veh		10.1			9.6			8.4			0.0	
Approach LOS		B			A			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		18.1		14.1		0.0		14.1
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.4		18.1		18.0		18.1
Max Q Clear Time (g_c+I1), s		10.0		6.7		0.0		5.8
Green Ext Time (p_c), s		3.5		3.0		0.0		3.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	149	9	2	19	111	481	5	5	565	8
Future Vol, veh/h	0	0	149	9	2	19	111	481	5	5	565	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	30	185	-	-	160	-	105
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	204	12	3	26	152	659	7	7	774	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	774	1754	1754	662	774	0	0	666	0	0
Stage 1	-	-	-	966	966	-	-	-	-	-	-	-
Stage 2	-	-	-	788	788	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	395	59	86	457	846	-	-	933	-	-
Stage 1	0	0	-	282	336	-	-	-	-	-	-	-
Stage 2	0	0	-	356	405	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	395	24	70	457	846	-	-	933	-	-
Mov Cap-2 Maneuver	-	-	-	24	70	-	-	-	-	-	-	-
Stage 1	-	-	-	231	276	-	-	-	-	-	-	-
Stage 2	-	-	-	171	402	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.5	99.1	1.9	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	846	-	-	395	27	457	933	-	-
HCM Lane V/C Ratio	0.18	-	-	0.517	0.558	0.057	0.007	-	-
HCM Control Delay (s)	10.2	-	-	23.5	247.2	13.4	8.9	-	-
HCM Lane LOS	B	-	-	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0.7	-	-	2.9	1.7	0.2	0	-	-

Project Driveway Option B

See Option A as noted in study

Project Driveway Option C

See Option A or B as noted in study

Cumulative Conditions – Short Term Plus Project with Mitigation Measures

Project Driveway Option A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	86	114	195	127	242	360
Future Volume (veh/h)	86	114	195	127	242	360
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1810	1827
Adj Flow Rate, veh/h	121	161	275	179	341	507
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Percent Heavy Veh, %	0	0	4	4	5	4
Cap, veh/h	150	200	633	412	571	1109
Arrive On Green	0.21	0.21	0.61	0.61	0.61	0.61
Sat Flow, veh/h	724	964	1043	679	907	1827
Grp Volume(v), veh/h	283	0	0	454	341	507
Grp Sat Flow(s),veh/h/ln	1694	0	0	1721	907	1827
Q Serve(g_s), s	7.7	0.0	0.0	6.8	15.6	7.3
Cycle Q Clear(g_c), s	7.7	0.0	0.0	6.8	22.5	7.3
Prop In Lane	0.43	0.57		0.39	1.00	
Lane Grp Cap(c), veh/h	351	0	0	1045	571	1109
V/C Ratio(X)	0.81	0.00	0.00	0.43	0.60	0.46
Avail Cap(c_a), veh/h	631	0	0	1166	635	1238
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	0.0	5.1	11.1	5.2
Incr Delay (d2), s/veh	4.4	0.0	0.0	0.3	1.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.0	3.2	4.1	3.8
LnGrp Delay(d),s/veh	22.7	0.0	0.0	5.4	12.4	5.5
LnGrp LOS	C			A	B	A
Approach Vol, veh/h	283		454			848
Approach Delay, s/veh	22.7		5.4			8.2
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		34.0				34.0		14.6
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		32.9				32.9		18.1
Max Q Clear Time (g_c+I1), s		8.8				24.5		9.7
Green Ext Time (p_c), s		9.5				5.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.0
HCM 2010 LOS	A

Notes

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

09/10/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	26	368	107	24	33	358	1851	69	61	1752	126
Future Volume (veh/h)	197	26	368	107	24	33	358	1851	69	61	1752	126
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1827	1845	1827	1792	1810	1863	1900	1863	1864	1900
Adj Flow Rate, veh/h	210	28	391	114	26	35	381	1969	73	65	1864	134
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	4	3	4	6	5	2	2	2	2	2
Cap, veh/h	285	210	841	133	61	51	332	3206	119	83	2377	170
Arrive On Green	0.16	0.12	0.12	0.08	0.03	0.03	0.19	0.64	0.64	0.05	0.49	0.49
Sat Flow, veh/h	1810	1827	2733	1757	1827	1524	1723	5034	186	1774	4843	347
Grp Volume(v), veh/h	210	28	391	114	26	35	381	1325	717	65	1304	694
Grp Sat Flow(s),veh/h/ln	1810	1827	1367	1757	1827	1524	1723	1695	1830	1774	1696	1797
Q Serve(g_s), s	14.9	1.9	11.9	8.7	1.9	2.7	26.0	31.5	31.6	4.9	42.9	43.2
Cycle Q Clear(g_c), s	14.9	1.9	11.9	8.7	1.9	2.7	26.0	31.5	31.6	4.9	42.9	43.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		0.19
Lane Grp Cap(c), veh/h	285	210	841	133	61	51	332	2159	1165	83	1665	882
V/C Ratio(X)	0.74	0.13	0.47	0.86	0.43	0.69	1.15	0.61	0.62	0.79	0.78	0.79
Avail Cap(c_a), veh/h	285	433	1174	133	406	339	332	2159	1165	103	1665	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.63	0.63	0.63	0.62	0.62	0.62
Uniform Delay (d), s/veh	54.2	53.7	22.8	61.7	64.0	51.2	54.5	14.6	14.6	63.7	28.4	28.5
Incr Delay (d2), s/veh	9.7	0.3	0.4	39.6	4.7	15.4	86.9	0.8	1.5	17.9	2.4	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	1.0	4.5	5.7	1.0	1.4	20.4	14.8	16.4	2.8	20.7	22.5
LnGrp Delay(d),s/veh	63.9	54.0	23.2	101.3	68.7	66.6	141.4	15.4	16.2	81.5	30.8	33.0
LnGrp LOS	E	D	C	F	E	E	F	B	B	F	C	C
Approach Vol, veh/h		629			175			2423			2063	
Approach Delay, s/veh		38.2			89.5			35.5			33.1	
Approach LOS		D			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	91.0	14.2	19.5	30.0	71.3	25.2	8.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.8	68.0	10.2	32.0	26.0	49.8	12.2	30.0
Max Q Clear Time (g_c+I1), s	6.9	33.6	10.7	13.9	28.0	45.2	16.9	4.7
Green Ext Time (p_c), s	0.0	34.3	0.0	1.6	0.0	4.5	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
9: Sierra College Blvd & I-80 WB Ramps

09/10/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	0	307	556	137	480	418	1639	392	0	2008	209
Future Volume (veh/h)	200	0	307	556	137	480	418	1639	392	0	2008	209
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1863	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	213	0	327	591	146	511	445	1744	417	0	2136	222
Adj No. of Lanes	1	0	1	2	1	2	2	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	166	0	0	1138	382	555	595	2940	924	0	1794	586
Arrive On Green	0.09	0.00	0.00	0.33	0.21	0.21	0.11	0.39	0.39	0.00	0.37	0.37
Sat Flow, veh/h	1810	213		3408	1863	2707	3476	5036	1583	0	5055	1599
Grp Volume(v), veh/h	213	225.9		591	146	511	445	1744	417	0	2136	222
Grp Sat Flow(s),veh/h/ln	1810	F		1704	1863	1354	1738	1679	1583	0	1631	1599
Q Serve(g_s), s	12.4			18.9	9.1	25.0	16.7	37.1	26.3	0.0	49.5	13.8
Cycle Q Clear(g_c), s	12.4			18.9	9.1	25.0	16.7	37.1	26.3	0.0	49.5	13.8
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	166			1138	382	555	595	2940	924	0	1794	586
V/C Ratio(X)	1.28			0.52	0.38	0.92	0.75	0.59	0.45	0.00	1.19	0.38
Avail Cap(c_a), veh/h	166			1424	538	782	595	2940	924	0	1794	586
HCM Platoon Ratio	1.00			1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.22	0.22
Uniform Delay (d), s/veh	61.3			36.2	46.3	52.6	56.9	28.4	25.1	0.0	42.8	31.4
Incr Delay (d2), s/veh	164.6			0.1	0.2	10.5	4.6	0.9	1.6	0.0	87.1	0.4
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.8			8.9	4.7	10.2	8.4	17.4	11.9	0.0	36.7	6.1
LnGrp Delay(d),s/veh	225.9			36.4	46.5	63.1	61.6	29.3	26.7	0.0	129.8	31.9
LnGrp LOS	F			D	D	E	E	C	C		F	C
Approach Vol, veh/h					1248			2606			2358	
Approach Delay, s/veh					48.5			34.4			120.6	
Approach LOS					D			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		85.0	50.0		29.3	55.7	17.0	33.0
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		67.5	56.4		13.3	* 50	12.4	39.0
Max Q Clear Time (g_c+I1), s		39.1	20.9		18.7	51.5	14.4	27.0
Green Ext Time (p_c), s		7.3	0.4		0.0	0.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	75.1
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	291	382	132	251	0	590	0	171	0	0	0
Future Volume (veh/h)	1	291	382	132	251	0	590	0	171	0	0	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1776	1845	1776	1792	1900	1900	1810	1827	1900	1900	1900
Adj Flow Rate, veh/h	1	303	0	138	261	0	615	0	178	0	0	0
Adj No. of Lanes	0	1	1	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	3	7	6	6	0	0	4	0	0	0
Cap, veh/h	102	513	453	526	518	0	791	0	713	0	5	0
Arrive On Green	0.29	0.29	0.00	0.29	0.29	0.00	0.46	0.00	0.46	0.00	0.00	0.00
Sat Flow, veh/h	1	1774	1568	1022	1792	0	1723	0	1553	0	1900	0
Grp Volume(v), veh/h	304	0	0	138	261	0	615	0	178	0	0	0
Grp Sat Flow(s),veh/h/ln	1775	0	1568	1022	1792	0	1723	0	1553	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	4.3	0.0	10.7	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	3.2	4.3	0.0	10.7	0.0	2.5	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	614	0	453	526	518	0	791	0	713	0	5	0
V/C Ratio(X)	0.49	0.00	0.00	0.26	0.50	0.00	0.78	0.00	0.25	0.00	0.00	0.00
Avail Cap(c_a), veh/h	996	0	791	746	904	0	1134	0	1022	0	266	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	10.9	0.0	0.0	10.2	10.6	0.0	8.1	0.0	5.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.8	0.0	2.2	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	1.1	2.2	0.0	5.4	0.0	1.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	11.5	0.0	0.0	10.4	11.3	0.0	10.3	0.0	6.1	0.0	0.0	0.0
LnGrp LOS	B			B	B		B		A			
Approach Vol, veh/h		304			399			793			0	
Approach Delay, s/veh		11.5			11.0			9.4			0.0	
Approach LOS		B			B			A				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		20.9		14.8		0.0		14.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.5		18.0		5.0		18.0
Max Q Clear Time (g_c+I1), s		12.7		7.2		0.0		6.3
Green Ext Time (p_c), s		3.7		3.1		0.0		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	81	1123	18	106	669
Future Volume (veh/h)	16	81	1123	18	106	669
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1863	1900	1863	1810
Adj Flow Rate, veh/h	17	87	1208	19	114	719
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	2	2	2	5
Cap, veh/h	22	110	1484	23	287	1468
Arrive On Green	0.08	0.08	0.81	0.81	0.81	0.81
Sat Flow, veh/h	266	1364	1829	29	453	1810
Grp Volume(v), veh/h	105	0	0	1227	114	719
Grp Sat Flow(s),veh/h/ln	1646	0	0	1858	453	1810
Q Serve(g_s), s	5.2	0.0	0.0	30.6	15.6	10.4
Cycle Q Clear(g_c), s	5.2	0.0	0.0	30.6	46.3	10.4
Prop In Lane	0.16	0.83		0.02	1.00	
Lane Grp Cap(c), veh/h	133	0	0	1508	287	1468
V/C Ratio(X)	0.79	0.00	0.00	0.81	0.40	0.49
Avail Cap(c_a), veh/h	355	0	0	1623	316	1581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	0.0	0.0	4.4	17.2	2.5
Incr Delay (d2), s/veh	9.8	0.0	0.0	3.1	0.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	16.3	2.0	5.1
LnGrp Delay(d),s/veh	47.5	0.0	0.0	7.5	18.1	2.7
LnGrp LOS	D			A	B	A
Approach Vol, veh/h	105		1227			833
Approach Delay, s/veh	47.5		7.5			4.8
Approach LOS	D		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		72.3				72.3		11.3
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		73.0				73.0		18.0
Max Q Clear Time (g_c+I1), s		32.6				48.3		7.2
Green Ext Time (p_c), s		28.4				19.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	215	177	554	192	24	180	807	520	29	801	123
Future Volume (veh/h)	139	215	177	554	192	24	180	807	520	29	801	123
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	148	229	188	589	204	26	191	859	553	31	852	131
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	182	315	467	675	501	429	223	1340	919	43	950	584
Arrive On Green	0.10	0.17	0.17	0.19	0.27	0.27	0.13	0.39	0.39	0.02	0.27	0.27
Sat Flow, veh/h	1757	1881	1568	3476	1863	1594	1707	3471	1583	1810	3539	1568
Grp Volume(v), veh/h	148	229	188	589	204	26	191	859	553	31	852	131
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1594	1707	1736	1583	1810	1770	1568
Q Serve(g_s), s	7.6	10.6	0.0	15.1	8.3	1.1	10.1	18.6	3.6	1.6	21.3	2.8
Cycle Q Clear(g_c), s	7.6	10.6	0.0	15.1	8.3	1.1	10.1	18.6	3.6	1.6	21.3	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	315	467	675	501	429	223	1340	919	43	950	584
V/C Ratio(X)	0.81	0.73	0.40	0.87	0.41	0.06	0.86	0.64	0.60	0.72	0.90	0.22
Avail Cap(c_a), veh/h	306	491	614	707	541	463	226	1340	919	98	966	591
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	36.3	25.7	35.9	27.6	25.0	39.1	23.0	4.0	44.6	32.4	7.2
Incr Delay (d2), s/veh	8.4	6.7	1.2	11.2	1.1	0.1	26.1	1.5	1.7	20.0	11.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	6.1	3.9	8.3	4.4	0.5	6.3	9.1	5.2	1.0	11.9	1.2
LnGrp Delay(d),s/veh	48.7	42.9	26.9	47.2	28.7	25.1	65.3	24.5	5.7	64.6	43.9	7.7
LnGrp LOS	D	D	C	D	C	C	E	C	A	E	D	A
Approach Vol, veh/h		565			819			1603			1014	
Approach Delay, s/veh		39.1			41.9			22.9			39.9	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	41.0	23.4	20.9	17.5	30.2	14.0	30.2
Change Period (Y+Rc), s	4.5	5.5	5.5	* 5.5	5.5	* 5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	32.3	18.7	* 24	12.2	* 25	16.0	26.7
Max Q Clear Time (g_c+I1), s	3.6	20.6	17.1	12.6	12.1	23.3	9.6	10.3
Green Ext Time (p_c), s	0.0	9.3	0.8	2.8	0.0	1.4	0.2	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
8: Sierra College Blvd & Granite Dr

09/10/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	23	298	118	24	23	301	1678	98	64	1789	143
Future Volume (veh/h)	159	23	298	118	24	23	301	1678	98	64	1789	143
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1863	1845	1759	1900	1827	1864	1900	1845	1864	1900
Adj Flow Rate, veh/h	166	24	310	123	25	24	314	1748	102	67	1864	149
Adj No. of Lanes	1	1	2	1	1	1	1	3	0	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	2	3	8	0	4	2	2	3	2	2
Cap, veh/h	191	111	1145	148	62	57	610	3323	194	85	1758	140
Arrive On Green	0.11	0.06	0.06	0.08	0.04	0.04	0.70	1.00	1.00	0.05	0.37	0.37
Sat Flow, veh/h	1740	1827	2787	1757	1759	1615	1740	4918	287	1757	4801	382
Grp Volume(v), veh/h	166	24	310	123	25	24	314	1205	645	67	1315	698
Grp Sat Flow(s),veh/h/ln	1740	1827	1393	1757	1759	1615	1740	1696	1813	1757	1696	1790
Q Serve(g_s), s	12.2	1.6	1.9	9.0	1.8	1.9	11.0	0.0	0.0	4.9	47.6	47.6
Cycle Q Clear(g_c), s	12.2	1.6	1.9	9.0	1.8	1.9	11.0	0.0	0.0	4.9	47.6	47.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		0.21
Lane Grp Cap(c), veh/h	191	111	1145	148	62	57	610	2292	1225	85	1242	656
V/C Ratio(X)	0.87	0.22	0.27	0.83	0.41	0.42	0.52	0.53	0.53	0.78	1.06	1.06
Avail Cap(c_a), veh/h	233	427	1628	230	406	373	610	2292	1225	143	1242	656
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.66	0.66	0.66	0.61	0.61	0.61
Uniform Delay (d), s/veh	56.9	58.1	12.9	58.6	61.4	61.4	14.3	0.0	0.0	61.2	41.2	41.2
Incr Delay (d2), s/veh	24.1	1.0	0.1	13.7	4.2	5.0	0.5	0.6	1.1	9.3	37.6	46.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.8	2.5	4.9	1.0	0.9	5.1	0.2	0.4	2.6	28.8	32.0
LnGrp Delay(d),s/veh	81.1	59.1	13.1	72.3	65.6	66.4	14.8	0.6	1.1	70.4	78.8	87.7
LnGrp LOS	F	E	B	E	E	E	B	A	A	E	F	F
Approach Vol, veh/h		500			172			2164			2080	
Approach Delay, s/veh		37.9			70.5			2.8			81.5	
Approach LOS		D			E			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	92.8	15.0	11.9	50.6	52.6	18.3	8.6
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	5.0	* 5	4.0	4.0
Max Green Setting (Gmax), s	10.6	55.0	17.0	30.4	18.0	* 48	17.4	30.0
Max Q Clear Time (g_c+I1), s	6.9	2.0	11.0	3.9	13.0	49.6	14.2	3.9
Green Ext Time (p_c), s	0.0	41.5	0.1	1.6	0.7	0.0	0.1	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	42.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	550	603	200	490	570	1363	418	0	1963	261
Future Volume (veh/h)	245	0	550	603	200	490	570	1363	418	0	1963	261
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1881	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	255	0	573	628	208	510	594	1420	435	0	2045	272
Adj No. of Lanes	1	0	1	2	1	2	2	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	155	0	0	1148	394	557	636	2955	911	0	1740	569
Arrive On Green	0.09	0.00	0.00	0.33	0.21	0.21	0.36	1.00	1.00	0.00	0.70	0.70
Sat Flow, veh/h	1810	255		3442	1881	2656	3510	5085	1568	0	5103	1615
Grp Volume(v), veh/h	255	379.2		628	208	510	594	1420	435	0	2045	272
Grp Sat Flow(s),veh/h/ln	1810	F		1721	1881	1328	1755	1695	1568	0	1647	1615
Q Serve(g_s), s	11.1			19.3	12.8	24.4	21.2	0.0	0.0	0.0	45.8	7.2
Cycle Q Clear(g_c), s	11.1			19.3	12.8	24.4	21.2	0.0	0.0	0.0	45.8	7.2
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	155			1148	394	557	636	2955	911	0	1740	569
V/C Ratio(X)	1.65			0.55	0.53	0.92	0.93	0.48	0.48	0.00	1.18	0.48
Avail Cap(c_a), veh/h	155			1459	564	797	636	2955	911	0	1740	569
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	2.00	2.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.69	0.69
Uniform Delay (d), s/veh	59.5			35.3	45.6	50.2	40.7	0.0	0.0	0.0	19.2	7.6
Incr Delay (d2), s/veh	319.8			0.2	0.4	9.5	20.8	0.6	1.8	0.0	83.3	2.0
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.3			9.2	6.7	9.7	12.1	0.2	0.5	0.0	33.4	3.4
LnGrp Delay(d),s/veh	379.2			35.5	46.1	59.7	61.5	0.6	1.8	0.0	102.5	9.6
LnGrp LOS	F			D	D	E	E	A	A		F	A
Approach Vol, veh/h					1346			2449			2317	
Approach Delay, s/veh					46.3			15.6			91.6	
Approach LOS					D			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		81.7	48.3		29.7	52.0	15.7	32.6
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		63.8	55.1		13.3	* 46	11.1	39.0
Max Q Clear Time (g_c+I1), s		2.0	21.3		23.2	47.8	13.1	26.4
Green Ext Time (p_c), s		5.8	0.5		0.0	0.0	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	64.3
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	23	97	46	10	42	107	432	58	40	523	81
Future Volume (veh/h)	58	23	97	46	10	42	107	432	58	40	523	81
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1771	1810	1900	1729	1900	1792	1803	1900	1597	1863	1863
Adj Flow Rate, veh/h	64	25	107	51	11	46	118	475	64	44	575	89
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	26	26	5	0	0	0	6	5	5	19	2	2
Cap, veh/h	85	19	545	90	10	572	148	643	87	61	684	568
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.09	0.41	0.41	0.04	0.37	0.37
Sat Flow, veh/h	0	53	1536	0	29	1613	1707	1556	210	1521	1863	1548
Grp Volume(v), veh/h	89	0	107	62	0	46	118	0	539	44	575	89
Grp Sat Flow(s),veh/h/ln	53	0	1536	29	0	1613	1707	0	1766	1521	1863	1548
Q Serve(g_s), s	0.0	0.0	3.5	0.0	0.0	1.4	5.0	0.0	18.8	2.1	20.6	2.8
Cycle Q Clear(g_c), s	25.9	0.0	3.5	25.9	0.0	1.4	5.0	0.0	18.8	2.1	20.6	2.8
Prop In Lane	0.72		1.00	0.82		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	104	0	545	100	0	572	148	0	730	61	684	568
V/C Ratio(X)	0.86	0.00	0.20	0.62	0.00	0.08	0.80	0.00	0.74	0.72	0.84	0.16
Avail Cap(c_a), veh/h	104	0	545	100	0	572	161	0	730	115	719	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	16.3	32.3	0.0	15.7	32.7	0.0	18.1	34.6	21.2	15.5
Incr Delay (d2), s/veh	47.4	0.0	0.2	11.8	0.0	0.1	23.1	0.0	5.3	16.5	10.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	1.5	1.6	0.0	0.6	3.3	0.0	10.2	1.2	12.5	1.3
LnGrp Delay(d),s/veh	78.5	0.0	16.5	44.1	0.0	15.7	55.8	0.0	23.4	51.1	31.4	15.9
LnGrp LOS	E		B	D		B	E		C	D	C	B
Approach Vol, veh/h		196			108			657			708	
Approach Delay, s/veh		44.7			32.0			29.2			30.6	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.1	35.6		30.4	10.4	32.2		30.4
Change Period (Y+Rc), s	4.1	5.4		4.5	4.1	5.4		4.5
Max Green Setting (Gmax), s	5.5	29.6		25.9	6.9	28.2		25.9
Max Q Clear Time (g_c+I1), s	4.1	20.8		27.9	7.0	22.6		27.9
Green Ext Time (p_c), s	0.0	7.0		0.0	0.0	4.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	279	733	14	22	723	504	43	15	22	450	24	273
Future Volume (veh/h)	279	733	14	22	723	504	43	15	22	450	24	273
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1882	1900	1810	1881	1827	1900	1846	1900	1881	1875	1863
Adj Flow Rate, veh/h	297	780	15	23	769	0	46	16	23	498	0	290
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	5	1	4	0	0	0	1	4	2
Cap, veh/h	334	1614	31	33	1011	439	138	52	75	866	0	381
Arrive On Green	0.19	0.45	0.45	0.02	0.28	0.00	0.08	0.08	0.08	0.24	0.00	0.24
Sat Flow, veh/h	1792	3588	69	1723	3574	1553	1810	679	976	3583	0	1575
Grp Volume(v), veh/h	297	389	406	23	769	0	46	0	39	498	0	290
Grp Sat Flow(s),veh/h/ln	1792	1787	1869	1723	1787	1553	1810	0	1655	1792	0	1575
Q Serve(g_s), s	14.8	14.0	14.0	1.2	18.0	0.0	2.2	0.0	2.0	11.2	0.0	15.7
Cycle Q Clear(g_c), s	14.8	14.0	14.0	1.2	18.0	0.0	2.2	0.0	2.0	11.2	0.0	15.7
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.59	1.00		1.00
Lane Grp Cap(c), veh/h	334	804	841	33	1011	439	138	0	126	866	0	381
V/C Ratio(X)	0.89	0.48	0.48	0.69	0.76	0.00	0.33	0.00	0.31	0.57	0.00	0.76
Avail Cap(c_a), veh/h	381	804	841	109	1053	457	138	0	126	1251	0	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.4	17.7	17.7	44.7	30.0	0.0	40.1	0.0	40.0	30.6	0.0	32.3
Incr Delay (d2), s/veh	20.3	1.6	1.6	22.4	4.8	0.0	6.4	0.0	6.2	0.9	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	7.3	7.6	0.8	9.5	0.0	1.3	0.0	1.2	5.6	0.0	7.3
LnGrp Delay(d),s/veh	56.7	19.4	19.3	67.0	34.8	0.0	46.5	0.0	46.3	31.5	0.0	37.3
LnGrp LOS	E	B	B	E	C		D		D	C		D
Approach Vol, veh/h		1092			792			85			788	
Approach Delay, s/veh		29.5			35.7			46.4			33.6	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.0	6.3	46.2		27.2	21.6	30.9
Change Period (Y+Rc), s		5.0	4.5	5.0		5.0	4.5	5.0
Max Green Setting (Gmax), s		7.0	5.8	40.7		32.0	19.5	27.0
Max Q Clear Time (g_c+I1), s		4.2	3.2	16.0		17.7	16.8	20.0
Green Ext Time (p_c), s		0.1	0.0	20.6		4.0	0.3	5.9

Intersection Summary	
HCM 2010 Ctrl Delay	33.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	195	335	354	174	4	356	3	159	3	2	11
Future Volume (veh/h)	6	195	335	354	174	4	356	3	159	3	2	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1787	1810	1863	1795	1900	1900	1828	1792	1900	1900	1900
Adj Flow Rate, veh/h	7	241	0	437	215	5	440	4	196	4	2	14
Adj No. of Lanes	0	1	1	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	6	6	5	2	6	6	0	0	6	0	0	0
Cap, veh/h	56	786	684	595	777	18	520	5	459	23	11	80
Arrive On Green	0.44	0.44	0.00	0.44	0.44	0.44	0.30	0.30	0.30	0.07	0.07	0.07
Sat Flow, veh/h	13	1767	1538	1134	1747	41	1726	16	1524	335	168	1173
Grp Volume(v), veh/h	248	0	0	437	0	220	444	0	196	20	0	0
Grp Sat Flow(s),veh/h/ln	1779	0	1538	1134	0	1788	1741	0	1524	1676	0	0
Q Serve(g_s), s	0.0	0.0	0.0	19.7	0.0	5.7	17.4	0.0	7.5	0.8	0.0	0.0
Cycle Q Clear(g_c), s	6.5	0.0	0.0	26.2	0.0	5.7	17.4	0.0	7.5	0.8	0.0	0.0
Prop In Lane	0.03		1.00	1.00		0.02	0.99		1.00	0.20		0.70
Lane Grp Cap(c), veh/h	843	0	684	595	0	795	524	0	459	115	0	0
V/C Ratio(X)	0.29	0.00	0.00	0.73	0.00	0.28	0.85	0.00	0.43	0.17	0.00	0.00
Avail Cap(c_a), veh/h	1085	0	897	752	0	1042	693	0	606	115	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.0	0.0	0.0	18.7	0.0	12.8	23.9	0.0	20.4	32.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	2.8	0.0	0.2	7.5	0.0	0.6	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	8.5	0.0	2.9	9.5	0.0	3.2	0.4	0.0	0.0
LnGrp Delay(d),s/veh	13.2	0.0	0.0	21.5	0.0	13.0	31.3	0.0	21.1	32.7	0.0	0.0
LnGrp LOS	B			C		B	C		C	C		
Approach Vol, veh/h		248			657			640			20	
Approach Delay, s/veh		13.2			18.6			28.2			32.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		26.5		36.9		9.5		36.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		29.0		42.5		5.0		42.5
Max Q Clear Time (g_c+I1), s		19.4		8.5		2.8		28.2
Green Ext Time (p_c), s		2.5		5.4		0.0		4.2

Intersection Summary	
HCM 2010 Ctrl Delay	21.9
HCM 2010 LOS	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	66	748	20	44	670
Future Volume (veh/h)	25	66	748	20	44	670
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1846	1900	1696	1827
Adj Flow Rate, veh/h	26	69	779	21	46	698
Adj No. of Lanes	0	0	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	3	3	12	4
Cap, veh/h	38	102	1198	32	452	1223
Arrive On Green	0.09	0.09	0.67	0.67	0.67	0.67
Sat Flow, veh/h	451	1198	1789	48	616	1827
Grp Volume(v), veh/h	96	0	0	800	46	698
Grp Sat Flow(s),veh/h/ln	1666	0	0	1838	616	1827
Q Serve(g_s), s	2.1	0.0	0.0	9.3	1.7	7.5
Cycle Q Clear(g_c), s	2.1	0.0	0.0	9.3	11.1	7.5
Prop In Lane	0.27	0.72		0.03	1.00	
Lane Grp Cap(c), veh/h	142	0	0	1230	452	1223
V/C Ratio(X)	0.68	0.00	0.00	0.65	0.10	0.57
Avail Cap(c_a), veh/h	818	0	0	1654	594	1645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	0.0	0.0	3.5	6.8	3.2
Incr Delay (d2), s/veh	5.5	0.0	0.0	0.6	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	4.6	0.3	3.8
LnGrp Delay(d),s/veh	21.8	0.0	0.0	4.1	6.9	3.7
LnGrp LOS	C			A	A	A
Approach Vol, veh/h	96		800			744
Approach Delay, s/veh	21.8		4.1			3.9
Approach LOS	C		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		29.0				29.0		7.6
Change Period (Y+Rc), s		4.5				4.5		4.5
Max Green Setting (Gmax), s		33.0				33.0		18.0
Max Q Clear Time (g_c+I1), s		11.3				13.1		4.1
Green Ext Time (p_c), s		12.1				11.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	5.0
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	29	130	69	11	4	106	181	48	7	181	57
Future Volume (veh/h)	87	29	130	69	11	4	106	181	48	7	181	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1858	1881	1900	1869	1900	1900	1851	1900	1900	1845	1827
Adj Flow Rate, veh/h	143	48	213	113	18	7	174	297	79	11	297	0
Adj No. of Lanes	0	1	1	0	1	0	1	1	0	1	1	1
Peak Hour Factor	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Percent Heavy Veh, %	0	0	1	0	0	0	0	2	2	0	3	4
Cap, veh/h	518	148	473	400	56	14	576	617	164	507	808	680
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.44	0.44	0.44	0.44	0.44	0.00
Sat Flow, veh/h	1122	501	1599	697	189	47	1099	1410	375	1023	1845	1553
Grp Volume(v), veh/h	191	0	213	138	0	0	174	0	376	11	297	0
Grp Sat Flow(s),veh/h/ln	1623	0	1599	933	0	0	1099	0	1785	1023	1845	1553
Q Serve(g_s), s	0.0	0.0	3.7	2.7	0.0	0.0	4.3	0.0	5.1	0.3	3.6	0.0
Cycle Q Clear(g_c), s	2.9	0.0	3.7	5.6	0.0	0.0	7.9	0.0	5.1	5.3	3.6	0.0
Prop In Lane	0.75		1.00	0.82		0.05	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	667	0	473	470	0	0	576	0	782	507	808	680
V/C Ratio(X)	0.29	0.00	0.45	0.29	0.00	0.00	0.30	0.00	0.48	0.02	0.37	0.00
Avail Cap(c_a), veh/h	1210	0	1064	912	0	0	1021	0	1504	921	1555	1309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	0.0	9.7	10.9	0.0	0.0	9.0	0.0	6.8	8.7	6.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.3	0.0	0.0	0.3	0.0	0.5	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.7	1.2	0.0	0.0	1.3	0.0	2.5	0.1	1.9	0.0
LnGrp Delay(d),s/veh	9.6	0.0	10.3	11.3	0.0	0.0	9.3	0.0	7.2	8.7	6.6	0.0
LnGrp LOS	A		B	B			A		A	A	A	
Approach Vol, veh/h		404			138			550			308	
Approach Delay, s/veh		10.0			11.3			7.9			6.7	
Approach LOS		A			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		19.3		14.5		19.3		14.5
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5
Max Q Clear Time (g_c+I1), s		9.9		5.7		7.3		7.6
Green Ext Time (p_c), s		4.9		2.6		5.1		2.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

HCS 2010 Two-Way Stop Control Summary Report

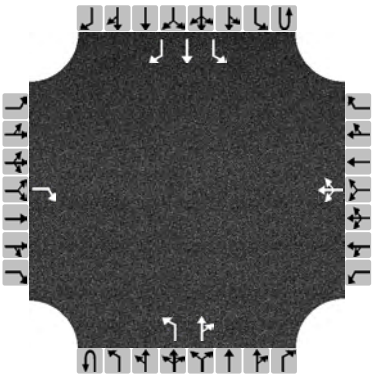
General Information

Analyst	NDD
Agency/Co.	Loomis
Date Performed	12/11/2018
Analysis Year	2020
Time Analyzed	Short Term plus Project
Intersection Orientation	North-South
Project Description	Loomis Costco

Site Information

Intersection	Taylor Road/Webb Street
Jurisdiction	Loomis
East/West Street	Webb Street
North/South Street	Taylor Road
Peak Hour Factor	0.73
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	1	0	0	1	1	0	0	1	1	1
Configuration				R			LTR			L		TR		L	T	R
Volume (veh/h)				176		9	2	19		136	690	5		5	798	8
Percent Heavy Vehicles				4		22	0	5		1				7		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)				241			41			186				7		
Capacity				258			3			636				703		
v/c Ratio				0.93			15.54			0.29				0.01		
95% Queue Length				8.5			7.0			1.2				0.0		
Control Delay (s/veh)				82.1			9141.2			13.0				10.2		
Level of Service (LOS)				F			F			B				B		
Approach Delay (s/veh)	82.1				9141.2				2.1				0.1			
Approach LOS	F				F											

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HCS 2010 Two-Way Stop Control Summary Report

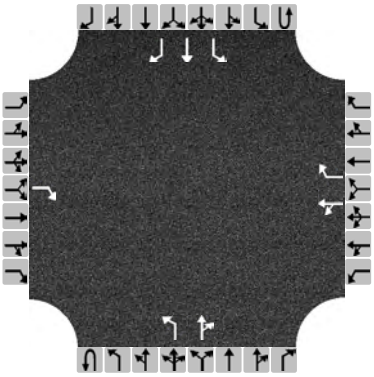
General Information

Analyst	NDD
Agency/Co.	Loomis
Date Performed	12/11/2018
Analysis Year	2020
Time Analyzed	Short Term plus Project
Intersection Orientation	North-South
Project Description	Loomis Costco

Site Information

Intersection	Taylor Road/Webb Street
Jurisdiction	Loomis
East/West Street	Webb Street
North/South Street	Taylor Road
Peak Hour Factor	0.73
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	1	1	0	1	1	0	0	1	1	1
Configuration				R		LT		R		L		TR		L	T	R
Volume (veh/h)				184		9	2	19		144	728	5		5	838	8
Percent Heavy Vehicles				4		22	0	5		1				7		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)				252		15		26		197				7		
Capacity				240		90		292		606				671		
v/c Ratio				1.05		0.17		0.09		0.32				0.01		
95% Queue Length				10.5		0.6		0.3		1.4				0.0		
Control Delay (s/veh)				116.8		52.9		18.6		13.8				10.4		
Level of Service (LOS)				F		F		C		B				B		
Approach Delay (s/veh)	116.8								2.3				0.1			
Approach LOS	F															

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Project Driveway Option B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	24	241	159	42	28	265	804	123	89	1301	95
Future Volume (veh/h)	108	24	241	159	42	28	265	804	123	89	1301	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1743	1638	1727	1746	1900	1792	1789	1900	1743	1846	1900
Adj Flow Rate, veh/h	112	25	251	166	44	29	276	838	128	93	1355	99
Adj No. of Lanes	1	1	2	2	1	0	1	3	0	1	3	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	9	16	10	10	10	6	7	7	9	3	3
Cap, veh/h	135	140	1146	219	66	43	661	2740	416	115	1502	110
Arrive On Green	0.08	0.08	0.08	0.07	0.07	0.07	0.77	1.00	1.00	0.07	0.31	0.31
Sat Flow, veh/h	1645	1743	2450	3191	984	648	1707	4280	650	1660	4788	350
Grp Volume(v), veh/h	112	25	251	166	0	73	276	636	330	93	951	503
Grp Sat Flow(s),veh/h/ln	1645	1743	1225	1596	0	1632	1707	1628	1674	1660	1680	1778
Q Serve(g_s), s	8.0	1.6	1.4	6.1	0.0	5.2	6.5	0.0	0.0	6.6	32.5	32.5
Cycle Q Clear(g_c), s	8.0	1.6	1.4	6.1	0.0	5.2	6.5	0.0	0.0	6.6	32.5	32.5
Prop In Lane	1.00		1.00	1.00		0.40	1.00		0.39	1.00		0.20
Lane Grp Cap(c), veh/h	135	140	1146	219	0	109	661	2084	1072	115	1054	558
V/C Ratio(X)	0.83	0.18	0.22	0.76	0.00	0.67	0.42	0.31	0.31	0.81	0.90	0.90
Avail Cap(c_a), veh/h	156	439	1566	298	0	408	661	2084	1072	190	1064	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.94	0.94	0.94	0.78	0.78	0.78
Uniform Delay (d), s/veh	54.3	51.5	9.1	54.9	0.0	54.7	9.0	0.0	0.0	55.1	39.4	39.4
Incr Delay (d2), s/veh	26.9	0.6	0.1	7.4	0.0	6.9	0.4	0.4	0.7	9.9	10.0	16.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.8	1.7	2.9	0.0	2.6	3.0	0.1	0.2	3.4	16.5	18.5
LnGrp Delay(d),s/veh	81.1	52.1	9.2	62.2	0.0	61.6	9.4	0.4	0.7	65.0	49.4	56.2
LnGrp LOS	F	D	A	E		E	A	A	A	E	D	E
Approach Vol, veh/h		388			239			1242			1547	
Approach Delay, s/veh		32.7			62.0			2.5			52.6	
Approach LOS		C			E			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.3	81.8	12.2	13.6	51.5	42.6	13.8	12.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	5.0	* 5	4.0	4.0
Max Green Setting (Gmax), s	13.7	47.9	11.2	30.2	23.6	* 38	11.4	30.0
Max Q Clear Time (g_c+I1), s	8.6	2.0	8.1	3.6	8.5	34.5	10.0	7.2
Green Ext Time (p_c), s	0.1	17.7	0.1	1.6	9.2	3.1	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	32.8
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	0	307	556	137	480	418	1639	392	0	2008	209
Future Volume (veh/h)	200	0	307	556	137	480	418	1639	392	0	2008	209
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1863	1845	1863	1810	1881	1845	1863	0	1792	1881
Adj Flow Rate, veh/h	213	0	327	591	146	511	445	1744	417	0	2136	222
Adj No. of Lanes	1	0	1	2	1	2	2	3	1	0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	2	3	2	5	1	3	2	0	6	1
Cap, veh/h	165	0	0	1135	382	555	586	2948	927	0	1817	594
Arrive On Green	0.09	0.00	0.00	0.33	0.20	0.20	0.34	1.00	1.00	0.00	0.74	0.74
Sat Flow, veh/h	1810	213		3408	1863	2707	3476	5036	1583	0	5055	1599
Grp Volume(v), veh/h	213	230.4		591	146	511	445	1744	417	0	2136	222
Grp Sat Flow(s),veh/h/ln	1810	F		1704	1863	1354	1738	1679	1583	0	1631	1599
Q Serve(g_s), s	12.4			19.0	9.2	25.2	15.5	0.0	0.0	0.0	50.5	4.9
Cycle Q Clear(g_c), s	12.4			19.0	9.2	25.2	15.5	0.0	0.0	0.0	50.5	4.9
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	165			1135	382	555	586	2948	927	0	1817	594
V/C Ratio(X)	1.29			0.52	0.38	0.92	0.76	0.59	0.45	0.00	1.18	0.37
Avail Cap(c_a), veh/h	165			1413	534	776	586	2948	927	0	1817	594
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	2.00	2.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.67	0.67
Uniform Delay (d), s/veh	61.8			36.6	46.6	53.0	42.6	0.0	0.0	0.0	17.5	6.3
Incr Delay (d2), s/veh	168.6			0.1	0.2	10.8	5.2	0.9	1.6	0.0	83.2	1.2
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.9			9.0	4.8	10.3	7.8	0.2	0.4	0.0	35.9	2.3
LnGrp Delay(d),s/veh	230.4			36.7	46.9	63.8	47.8	0.9	1.6	0.0	100.7	7.5
LnGrp LOS	F			D	D	E	D	A	A		F	A
Approach Vol, veh/h					1248			2606			2358	
Approach Delay, s/veh					49.0			9.0			92.0	
Approach LOS					D			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		85.8	50.2		29.1	56.7	17.0	33.2
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		68.5	56.4		13.3	* 51	12.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	21.0		17.5	52.5	14.4	27.2
Green Ext Time (p_c), s		7.7	0.4		0.0	0.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	54.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	27	298	174	28	23	301	1619	157	64	1733	139
Future Volume (vph)	155	27	298	174	28	23	301	1619	157	64	1733	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1827	2787	3400	1697		1736	5016		1752	5027	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1736	1827	2787	3400	1697		1736	5016		1752	5027	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	161	28	310	181	29	24	314	1686	164	67	1805	145
RTOR Reduction (vph)	0	0	37	0	23	0	0	7	0	0	5	0
Lane Group Flow (vph)	161	28	273	181	30	0	314	1843	0	67	1945	0
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	4%	4%	2%	3%	8%	0%	4%	2%	1%	3%	2%	1%
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	15.5	8.7	33.3	14.5	7.7		24.6	76.1		13.7	65.2	
Effective Green, g (s)	15.5	8.7	33.3	14.5	7.7		24.6	76.1		13.7	65.2	
Actuated g/C Ratio	0.12	0.07	0.26	0.11	0.06		0.19	0.59		0.11	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	206	122	713	379	100		328	2936		184	2521	
v/s Ratio Prot	c0.09	0.02	c0.07	0.05	0.02		c0.18	0.37		0.04	c0.39	
v/s Ratio Perm			0.03									
v/c Ratio	0.78	0.23	0.38	0.48	0.30		0.96	0.63		0.36	0.77	
Uniform Delay, d1	55.6	57.5	39.9	54.2	58.6		52.2	17.7		54.1	26.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.05	0.84		1.00	1.00	
Incremental Delay, d2	17.3	1.0	0.3	1.0	1.7		33.0	0.8		1.2	2.4	
Delay (s)	72.9	58.4	40.2	55.1	60.3		87.8	15.6		55.3	28.7	
Level of Service	E	E	D	E	E		F	B		E	C	
Approach Delay (s)		51.8			56.3			26.1			29.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	0	550	603	200	490	570	1363	418	0	1963	261
Future Volume (veh/h)	245	0	550	603	200	490	570	1363	418	0	1963	261
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1881	1863	1881	1776	1900	1863	1845	0	1810	1900
Adj Flow Rate, veh/h	255	0	573	628	208	510	594	1420	435	0	2045	272
Adj No. of Lanes	1	0	1	2	1	2	2	3	1	0	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	2	1	7	0	2	3	0	5	0
Cap, veh/h	173	0	0	1182	394	557	663	2904	895	0	1653	540
Arrive On Green	0.10	0.00	0.00	0.34	0.21	0.21	0.38	1.00	1.00	0.00	0.67	0.67
Sat Flow, veh/h	1810	255		3442	1881	2656	3510	5085	1568	0	5103	1615
Grp Volume(v), veh/h	255	302.1		628	208	510	594	1420	435	0	2045	272
Grp Sat Flow(s),veh/h/ln	1810	F		1721	1881	1328	1755	1695	1568	0	1647	1615
Q Serve(g_s), s	12.4			19.0	12.8	24.4	20.7	0.0	0.0	0.0	43.5	8.0
Cycle Q Clear(g_c), s	12.4			19.0	12.8	24.4	20.7	0.0	0.0	0.0	43.5	8.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	173			1182	394	557	663	2904	895	0	1653	540
V/C Ratio(X)	1.48			0.53	0.53	0.92	0.90	0.49	0.49	0.00	1.24	0.50
Avail Cap(c_a), veh/h	173			1493	564	797	663	2904	895	0	1653	540
HCM Platoon Ratio	1.00			1.00	1.00	1.00	2.00	2.00	2.00	1.00	2.00	2.00
Upstream Filter(I)	1.00			1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.67	0.67
Uniform Delay (d), s/veh	58.8			34.3	45.6	50.2	39.3	0.0	0.0	0.0	21.5	8.6
Incr Delay (d2), s/veh	243.3			0.1	0.4	9.5	14.5	0.6	1.9	0.0	110.4	2.2
Initial Q Delay(d3),s/veh	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.9			9.1	6.7	9.7	11.2	0.2	0.5	0.0	35.9	3.8
LnGrp Delay(d),s/veh	302.1			34.4	46.1	59.7	53.7	0.6	1.9	0.0	131.9	10.9
LnGrp LOS	F			C	D	E	D	A	A		F	B
Approach Vol, veh/h					1346			2449			2317	
Approach Delay, s/veh					45.8			13.7			117.7	
Approach LOS					D			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3		5	6	7	8
Phs Duration (G+Y+Rc), s		80.4	49.6		30.7	49.7	17.0	32.6
Change Period (Y+Rc), s		6.2	4.9		6.2	* 6.2	4.6	5.3
Max Green Setting (Gmax), s		62.5	56.4		14.3	* 44	12.4	39.0
Max Q Clear Time (g_c+I1), s		2.0	21.0		22.7	45.5	14.4	26.4
Green Ext Time (p_c), s		5.8	0.5		0.0	0.0	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	69.9
HCM 2010 LOS	E

Notes

Project Driveway Option C

See Option A or B as noted in study

Cumulative Conditions – Long Term Plus Project with Mitigation Measures

Project Driveway Option A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	220	266	533	170	35	179	753	546	40	769	40
Future Volume (veh/h)	80	220	266	533	170	35	179	753	546	40	769	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1881	1845	1881	1863	1900	1792	1827	1863	1900	1863	1845
Adj Flow Rate, veh/h	85	234	283	567	181	37	190	801	581	43	818	43
Adj No. of Lanes	1	1	1	2	1	1	1	2	1	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	3	1	2	0	6	4	2	0	2	3
Cap, veh/h	109	390	531	637	612	524	225	1258	864	55	924	507
Arrive On Green	0.06	0.21	0.21	0.18	0.33	0.33	0.13	0.36	0.36	0.03	0.26	0.26
Sat Flow, veh/h	1757	1881	1568	3476	1863	1595	1707	3471	1583	1810	3539	1568
Grp Volume(v), veh/h	85	234	283	567	181	37	190	801	581	43	818	43
Grp Sat Flow(s),veh/h/ln	1757	1881	1568	1738	1863	1595	1707	1736	1583	1810	1770	1568
Q Serve(g_s), s	4.4	10.4	13.4	14.7	6.7	1.5	10.0	17.6	24.3	2.2	20.5	1.8
Cycle Q Clear(g_c), s	4.4	10.4	13.4	14.7	6.7	1.5	10.0	17.6	24.3	2.2	20.5	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	390	531	637	612	524	225	1258	864	55	924	507
V/C Ratio(X)	0.78	0.60	0.53	0.89	0.30	0.07	0.85	0.64	0.67	0.79	0.89	0.08
Avail Cap(c_a), veh/h	181	469	597	659	626	536	305	1298	882	98	924	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	33.1	24.6	36.8	23.0	21.3	39.1	24.4	15.0	44.4	32.8	21.7
Incr Delay (d2), s/veh	11.4	3.2	1.8	13.9	0.6	0.1	14.8	1.5	2.7	21.3	10.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	5.7	6.1	8.2	3.5	0.7	5.7	8.7	11.1	1.4	11.4	0.8
LnGrp Delay(d),s/veh	54.1	36.3	26.4	50.7	23.6	21.4	53.9	25.8	17.7	65.7	43.6	21.9
LnGrp LOS	D	D	C	D	C	C	D	C	B	E	D	C
Approach Vol, veh/h		602			785			1572			904	
Approach Delay, s/veh		34.1			43.1			26.2			43.6	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	38.9	21.4	24.6	16.6	29.6	10.2	35.8
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.0	34.5	17.5	23.0	16.5	23.0	9.5	31.0
Max Q Clear Time (g_c+I1), s	4.2	26.3	16.7	15.4	12.0	22.5	6.4	8.7
Green Ext Time (p_c), s	0.0	7.1	0.2	3.7	0.2	0.5	0.0	7.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	340	636	348	145	5	1025	10	363	5	5	15
Future Volume (veh/h)	5	340	636	348	145	5	1025	10	363	5	5	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1624	1792	1810	1863	1796	1900	1827	1795	1900	1900	1900	1900
Adj Flow Rate, veh/h	6	420	0	430	179	6	1265	12	448	6	6	19
Adj No. of Lanes	1	1	1	1	1	0	2	1	0	1	1	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	17	6	5	2	6	6	4	0	0	0	0	0
Cap, veh/h	12	412	354	408	781	26	1262	15	558	47	10	33
Arrive On Green	0.01	0.23	0.00	0.23	0.45	0.45	0.37	0.37	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1547	1792	1538	1774	1728	58	3375	40	1492	1810	402	1273
Grp Volume(v), veh/h	6	420	0	430	0	185	1265	0	460	6	0	25
Grp Sat Flow(s),veh/h/ln	1547	1792	1538	1774	0	1786	1688	0	1532	1810	0	1675
Q Serve(g_s), s	0.5	29.5	0.0	29.5	0.0	8.1	48.0	0.0	34.5	0.4	0.0	1.9
Cycle Q Clear(g_c), s	0.5	29.5	0.0	29.5	0.0	8.1	48.0	0.0	34.5	0.4	0.0	1.9
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.97	1.00		0.76
Lane Grp Cap(c), veh/h	12	412	354	408	0	807	1262	0	573	47	0	44
V/C Ratio(X)	0.52	1.02	0.00	1.05	0.00	0.23	1.00	0.00	0.80	0.13	0.00	0.57
Avail Cap(c_a), veh/h	60	412	354	408	0	807	1262	0	573	70	0	65
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.5	49.4	0.0	49.4	0.0	21.5	40.2	0.0	35.9	61.1	0.0	61.8
Incr Delay (d2), s/veh	31.4	49.4	0.0	59.7	0.0	0.1	25.8	0.0	8.1	1.2	0.0	11.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	20.2	0.0	21.1	0.0	4.0	26.8	0.0	15.9	0.2	0.0	1.0
LnGrp Delay(d),s/veh	94.8	98.8	0.0	109.1	0.0	21.6	66.0	0.0	44.0	62.3	0.0	73.1
LnGrp LOS	F	F		F		C	F		D	E		E
Approach Vol, veh/h		426			615			1725			31	
Approach Delay, s/veh		98.7			82.8			60.1			71.0	
Approach LOS		F			F			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		52.5	34.0	34.0		7.8	5.5	62.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		48.0	29.5	29.5		5.0	5.0	54.0
Max Q Clear Time (g_c+I1), s		50.0	31.5	31.5		3.9	2.5	10.1
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	71.1
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	11.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	149	10	5	20	88	818	5	5	650	10
Future Vol, veh/h	0	0	149	10	5	20	88	818	5	5	650	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	50	100	-	-	100	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	50	4	22	0	5	1	2	0	0	2	13
Mvmt Flow	0	0	204	14	7	27	121	1121	7	7	890	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	890	2269	2269	1124	890	0	0	1127	0	0
Stage 1	-	-	-	1365	1365	-	-	-	-	-	-	-
Stage 2	-	-	-	904	904	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.24	7.32	6.5	6.25	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.32	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.336	3.698	4	3.345	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	339	25	41	246	766	-	-	627	-	-
Stage 1	0	0	-	165	217	-	-	-	-	-	-	-
Stage 2	0	0	-	306	358	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	339	~ 9	34	246	766	-	-	627	-	-
Mov Cap-2 Maneuver	-	-	-	~ 9	34	-	-	-	-	-	-	-
Stage 1	-	-	-	139	183	-	-	-	-	-	-	-
Stage 2	-	-	-	120	354	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.5	$ 428.9	1	0.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	766	-	-	339	12	246	627	-	-
HCM Lane V/C Ratio	0.157	-	-	0.602	1.712	0.111	0.011	-	-
HCM Control Delay (s)	10.6	-	-	30.5	$ 972.1	21.5	10.8	-	-
HCM Lane LOS	B	-	-	D	F	C	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-	3.7	3.4	0.4	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Project Driveway Option B

See Option A as noted in study

Project Driveway Option C

See Option A as noted in study

Appendix C: Queuing Summary Tables and Queuing Worksheets (Synchro)

Existing Conditions

Existing Conditions - Storage Length

Intersection #	Street Name North-South	Storage Length (feet) NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	200	970	350	280	490	-	65	215	150	95	585	-
2	Taylor Road & Horseshoe Bar Road	100	400	125	190	380	-	-	115	-	-	160	160
3	Horseshoe Bar Road & I-80 Westbound Ramp	85	680	-	160	450	95	-	935	250	275	95	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	2,350	100	-	685	-	-	-	-	-	1,080	-
5	Barton Road & Brace Road	-	2,895	-	-	-	-	-	1,980	-	-	560	-
6	Sierra College Boulevard & Taylor Road	210	550	550	210	1,500	450	150	900	250	215	2,060	215
7	Sierra College Boulevard & Brace Road	-	1,265	-	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	60	230	150
9	Sierra College Boulevard & I-80 WB Ramps	200	1,530	325	-	370	150	530	-	530	740	1,320	740
10	Sierra College Boulevard & I-80 EB Ramps	-	710	280	250	1,530	500	1,315	1,315	205	345	-	330
11	Sierra College Boulevard & Schriber Way	-	395	-	-	300	-	-	-	-	-	-	415
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	90	1,675	45	245	710	340	190	275	-	285	745	185
13	Sierra College Boulevard & Stadium Dwy	215	1,580	-	-	1,690	-	70	-	90	-	-	-
14	Sierra College Boulevard & Rocklin Road	245	650	-	245	1,575	175	240	925	925	315	1,325	-
15	Pacific Street & Dominguez Road/Delmar Avenue	210	1,860	-	200	850	150	-	700	315	-	1,935	140
16	Pacific Street & Rocklin Road	265	420	110	230	410	-	130	285	-	250	330	330
17	Granite Drive & Rocklin Road	100	140	-	325	625	625	225	675	-	135	650	150
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	635	1,165	-	-	580	280	300	555	-
19	I-80 Eastbound Ramps & Rocklin Road	455	1,115	455	-	-	-	170	520	-	-	370	-
20	Aguilar Road & Rocklin Road	320	-	320	-	-	-	75	400	-	85	1,260	-
21	Sierra College Boulevard & Driveway South of Brace Road	135	1,000	-	-	220	-	-	-	60	-	-	-
22	Dominguez Road & Granite Driive	220	1,390	-	-	730	-	370	-	50	-	-	-
23	El Don Drive & Rocklin Road	140	530	-	-	580	95	410	1,260	-	265	1,430	-
24	Sierra College Boulevard & Project Driveway	Does not exist											
25	Brace Road & Project Driveway	Does not exist											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1900	600	465	2500	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	4500	-	100	1300	-	-	-	-	1450	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	105	1100	210	105	3100	-	-	85	30	-	910	30
29	Taylor Road & English Colony Way-Rock Springs Road	150	1,900	-	140	350	115	-	560	30	-	940	-
30	Taylor Road & Penryn Road (North	85	170	-	-	555	-	55	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	2600	-	85	180	-	-	-	-	495	-	-
32	Taylor Road & Del Oro High School North Lot	-	185	-	70	1600	-	-	-	-	200	-	45
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Drop Off	150	300	-	90	190	-	-	50	-	-	75	-
34	Taylor Road & Del Oro High School South Lot	-	1200	-	150	300	-	-	-	-	65	-	65
35	Taylor Road & Rippey Road	140	465	-	-	610	-	3500	-	-	-	-	-
36	Taylor Road & Webb Street	185	370	-	160	500	105	-	-	1070	-	190	-
37	Project Driveway East & Brace Road	Does not exist											

Existing AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**263**	382	34	73	218	-	**213**	152	61	**168**	294	-
2	Taylor Road & Horseshoe Bar Road	6	169	18	**#347**	120	-	-	47	-	-	49	**94**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**207**	212	-	41	211	**132**	-	#194	48	81	**100**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	8	-	-	-	-	-	-	363	-
5	Barton Road & Brace Road	-	15	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	180	244	29	54	#815	15	94	200	-	122	202	-
7	Sierra College Boulevard & Brace Road	-	124	-	92	93	-	-	-	6	75	-	32
8	Sierra College Boulevard & Granite Drive	264	172	33	129	366	37	109	49	32	**192**	70	-
9	Sierra College Boulevard & I-80 WB Ramps	82	77	23	-	210	7	13	-	19	206	117	50
10	Sierra College Boulevard & I-80 EB Ramps	-	108	-	61	207	24	80	39	48	42	-	34
11	Sierra College Boulevard & Schriber Way	-	-	-	-	-	-	-	-	-	-	-	9
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	-	125	-	46	235	-	9	-	-	24	5	-
13	Sierra College Boulevard & Stadium Dwy	85	52	-	-	183	-	19	-	13	-	-	-
14	Sierra College Boulevard & Rocklin Road	**231**	355	-	141	227	82	139	130	50	152	221	-
15	Pacific Street & Dominguez Road/Delmar Avenue	81	217	-	38	188	16	-	53	33	-	79	13
16	Pacific Street & Rocklin Road	102	260	**455**	**243**	220	-	62	112	-	**395**	**408**	50
17	Granite Drive & Rocklin Road	28	36	-	205	207	39	**#239**	417	-	45	341	**330**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	50	135	-	-	#289	75	270	182	-
19	I-80 Eastbound Ramps & Rocklin Road	**#508**	#317	260	-	-	-	**#177**	124	-	-	301	-
20	Aguilar Road & Rocklin Road	135	-	7	-	-	-	63	382	-	22	158	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	5	-	-	-	-	-	10	-	5	-	-	-
23	El Don Drive & Rocklin Road	**167**	34	-	-	36	23	**#764**	345	-	26	253	-
24	Sierra College Boulevard & Project Driveway	DNE											
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	73	8	-	-	-	-	70	245	35	68	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	8	-	-	-	-	-	10	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	-	-	-	28	-
29	Taylor Road & English Colony Way-Rock Springs Road	25	73	-	-	168	25	-	40	**63**	-	55	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	33	-	-	-	-	-	385	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	25	-	-	-	-	-	58	-	18
33	Taylor Road & First Baptist Church Driveway/Del Oro High School	-	-	-	15	-	-	-	-	-	-	**490**	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	18	-	-	-	-	-	**148**	-	15
35	Taylor Road & Rippey Road	8	-	-	-	-	-	10	-	-	-	-	-
36	Taylor Road & Webb Street	13	-	-	3	-	-	-	-	48	-	5	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity

Existing PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#314**	280	42	70	155	-	**74**	132	79	**125**	151	-
2	Taylor Road & Horseshoe Bar Road	31	249	24	**#384**	205	-	-	46	-	-	77	**145**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**131**	217	-	72	177	78	-	#203	37	**131**	**77**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	388	-
5	Barton Road & Brace Road	-	15	-	-	-	-	-	-	-	-	3	-
6	Sierra College Boulevard & Taylor Road	166	**#965**	58	51	#616	6	**163**	324	54	166	325	-
7	Sierra College Boulevard & Brace Road	-	248	-	89	91	-	-	-	19	92	-	38
8	Sierra College Boulevard & Granite Drive	**267**	325	30	101	427	36	**217**	53	47	**153**	53	-
9	Sierra College Boulevard & I-80 WB Ramps	**288**	152	34	-	**378**	52	110	-	22	197	186	60
10	Sierra College Boulevard & I-80 EB Ramps	-	268	38	124	178	35	154	119	34	126	-	248
11	Sierra College Boulevard & Schriber Way	-	-	-	-	-	-	-	-	-	-	-	9
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	8	242	13	42	229	-	14	-	-	45	-	-
13	Sierra College Boulevard & Stadium Dwy	27	135	-	-	110	-	39	-	29	-	-	-
14	Sierra College Boulevard & Rocklin Road	187	**#659**	-	199	243	98	**287**	155	73	91	187	-
15	Pacific Street & Dominguez Road/Delmar Avenue	56	402	-	33	272	-	-	83	43	-	100	13
16	Pacific Street & Rocklin Road	97	364	**521**	183	356	-	65	94	-	**552**	**556**	128
17	Granite Drive & Rocklin Road	**79**	45	-	**347**	346	69	**#338**	369	-	76	513	**333**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	46	200	-	-	#327	89	**#531**	228	-
19	I-80 Eastbound Ramps & Rocklin Road	311	278	113	-	-	-	**#243**	123	-	-	**#584**	-
20	Aguilar Road & Rocklin Road	87	-	3	-	-	-	61	232	-	32	286	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	3	-	-	-
22	Dominguez Road & Granite Driive	3	-	-	-	0	-	15	-	5	-	-	-
23	El Don Drive & Rocklin Road	**158**	29	-	-	126	**100**	243	386	-	40	351	-
24	Sierra College Boulevard & Project Driveway	DNE											
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	415	23	-	-	-	-	103	63	18	83	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	13	-	-	-	-	-	23	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	3	-	-	28	-
29	Taylor Road & English Colony Way-Rock Springs Road	20	85	-	0	28	13	-	28	15	-	18	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	10	-	-	-	-	-	55	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	8	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School	-	-	-	-	-	-	-	-	-	-	10	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	43	-	5
35	Taylor Road & Rippey Road	3	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	25	-	-	-	-	-	-	-	30	-	8	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity

Existing SAT

Intersection #	Street Name North-South	95th Percentile Queues NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	147	143	27	34	101	-	60	54	43	**133**	78	-
2	Taylor Road & Horseshoe Bar Road	22	159	26	**#249**	155	-	-	28	-	-	79	28
3	Horseshoe Bar Road & I-80 Westbound Ramp	**156**	150	-	52	134	65	-	#175	30	87	**99**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	5	-	-	-	-	-	185	-
5	Barton Road & Brace Road	-	40	-	-	-	-	-	0	-	-	5	-
6	Sierra College Boulevard & Taylor Road	157	283	34	55	352	-	103	216	25	129	183	-
7	Sierra College Boulevard & Brace Road	-	136	-	63	70	-	-	-	-	79	-	18
8	Sierra College Boulevard & Granite Drive	191	153	30	83	243	45	129	41	38	**130**	42	-
9	Sierra College Boulevard & I-80 WB Ramps	**347**	91	34	-	268	41	108	-	77	163	200	58
10	Sierra College Boulevard & I-80 EB Ramps	-	133	39	147	105	32	114	118	22	107	-	196
11	Sierra College Boulevard & Schriber Way	-	-	-	-	-	-	-	-	-	-	-	12
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	4	112	24	34	137	-	8	-	-	29	4	-
13	Sierra College Boulevard & Stadium Dwy	16	66	-	-	73	-	14	-	14	-	-	-
14	Sierra College Boulevard & Rocklin Road	81	217	-	112	110	31	130	81	54	58	95	-
15	Pacific Street & Dominguez Road/Delmar Avenue	26	158	-	28	202	22	-	60	5	-	23	9
16	Pacific Street & Rocklin Road	30	181	**170**	100	144	-	41	41	-	208	210	40
17	Granite Drive & Rocklin Road	62	40	-	253	257	61	**#294**	212	-	48	216	96
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	43	61	-	-	154	61	294	67	-
19	I-80 Eastbound Ramps & Rocklin Road	253	243	55	-	-	-	156	81	-	-	249	-
20	Aguilar Road & Rocklin Road	64	-	2	-	-	-	47	117	-	17	122	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	5	-	-	-	-	-	10	-	5	-	-	-
23	El Don Drive & Rocklin Road	81	15	-	-	36	39	48	207	-	33	198	-
24	Sierra College Boulevard & Project Driveway	DNE											
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	103	23	-	3	-	-	70	53	155	53	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	3	-	-	-	-	-	10	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	-	-	-	18	-
29	Taylor Road & English Colony Way-Rock Springs Road	35	78	-	3	53	18	-	50	**40**	-	28	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	8	-	-	-	-	-	25	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	-	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School	-	-	-	3	-	-	-	-	-	-	25	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	-	-	-	-	-	-	33	-	5
35	Taylor Road & Rippey Road	5	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	15	-	-	-	-	-	-	-	58	-	45	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	197	136	256	155	297	240	415	92	46	475
v/c Ratio	0.64	0.45	0.55	0.40	0.75	0.68	0.62	0.16	0.33	0.70
Control Delay	49.4	43.4	10.0	38.4	46.0	48.6	33.4	6.6	55.0	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	43.4	10.0	38.4	46.0	48.6	33.4	6.6	55.0	40.6
Queue Length 50th (ft)	112	75	0	81	151	135	214	0	27	131
Queue Length 95th (ft)	213	152	61	168	294	263	382	34	73	218
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	553	545	632	548	554	489	846	728	518	1506
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.25	0.41	0.28	0.54	0.49	0.49	0.13	0.09	0.32

Intersection Summary

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	62	527	2	349	59	460	367
v/c Ratio	0.23	0.21	0.59	0.01	0.59	0.11	0.74	0.26
Control Delay	19.5	22.1	6.0	25.0	19.2	4.5	28.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	22.1	6.0	25.0	19.2	4.5	28.7	4.8
Queue Length 50th (ft)	14	16	22	1	89	0	123	31
Queue Length 95th (ft)	47	49	94	6	169	18	#347	120
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	762	773	900	644	1445	1192	619	1427
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.59	0.00	0.24	0.05	0.74	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	99	133	55	86	182	631	20	241	398
v/c Ratio	0.73	0.20	0.32	0.47	0.67	0.45	0.17	0.53	0.64
Control Delay	67.7	6.8	48.4	44.8	51.8	20.4	50.7	33.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	6.8	48.4	44.8	51.8	20.4	50.7	33.5	11.7
Queue Length 50th (ft)	50	0	30	37	99	120	11	116	34
Queue Length 95th (ft)	#194	48	81	100	207	212	41	211	132
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	135	651	532	527	426	1747	434	871	906
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.20	0.10	0.16	0.43	0.36	0.05	0.28	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	66	183	86	219	190	22	156	296	164	30	633	117
v/c Ratio	0.41	0.58	0.22	0.54	0.48	0.05	0.64	0.35	0.16	0.24	0.96	0.17
Control Delay	53.8	46.8	1.2	48.4	40.8	0.2	53.7	21.2	2.0	52.5	62.3	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	46.8	1.2	48.4	40.8	0.2	53.7	21.2	2.0	52.5	62.3	2.0
Queue Length 50th (ft)	40	107	0	68	109	0	94	124	0	18	388	0
Queue Length 95th (ft)	94	200	0	122	202	0	180	244	29	54	#815	15
Internal Link Dist (ft)		429			1915			582			10000	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	342	541	563	864	614	614	413	852	1239	349	656	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.34	0.15	0.25	0.31	0.04	0.38	0.35	0.13	0.09	0.96	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	111	111	97	588	135	804
v/c Ratio	0.24	0.29	0.24	0.36	0.50	0.34
Control Delay	1.8	20.4	7.1	12.3	27.4	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	20.4	7.1	12.3	27.4	5.2
Queue Length 50th (ft)	0	25	0	60	34	49
Queue Length 95th (ft)	6	75	32	124	92	93
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)	860	100	1000		170	
Base Capacity (vph)	935	1031	914	2599	649	3449
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.11	0.11	0.23	0.21	0.23

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	24	114	155	43	29	234	491	118	93	819	86
v/c Ratio	0.40	0.18	0.38	0.56	0.20	0.11	0.63	0.33	0.16	0.45	0.67	0.14
Control Delay	51.8	52.4	14.2	48.4	45.2	0.8	44.8	18.7	3.9	51.1	30.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	52.4	14.2	48.4	45.2	0.8	44.8	18.7	3.9	51.1	30.6	7.0
Queue Length 50th (ft)	41	13	0	84	23	0	124	96	0	51	213	2
Queue Length 95th (ft)	109	49	32	192	70	0	264	172	33	129	366	37
Internal Link Dist (ft)		707			453			403			1015	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	545	578	890	545	573	560	848	2713	1279	366	1941	901
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.04	0.13	0.28	0.08	0.05	0.28	0.18	0.09	0.25	0.42	0.10

Intersection Summary

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	70	669	164	154	84	681	159	1119	42
v/c Ratio	0.03	0.28	0.69	0.37	0.32	0.42	0.25	0.18	0.65	0.07
Control Delay	33.8	8.2	25.4	19.6	7.1	35.9	8.0	2.1	19.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	8.2	25.4	19.6	7.1	35.9	8.0	2.1	19.5	1.5
Queue Length 50th (ft)	2	0	118	36	0	31	45	0	127	0
Queue Length 95th (ft)	13	19	206	117	50	82	77	23	210	7
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	576	769	3069	900	869	831	4739	1389	2588	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.09	0.22	0.18	0.18	0.10	0.14	0.11	0.43	0.04

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	352	108	210	45	108	870	23	198	1151	194
v/c Ratio	0.37	0.18	0.48	0.17	0.32	0.57	0.05	0.37	0.64	0.23
Control Delay	15.8	22.5	8.8	24.6	8.7	18.4	0.2	23.0	11.6	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	22.5	8.8	24.6	8.7	18.4	0.2	23.0	11.6	2.3
Queue Length 50th (ft)	40	15	0	12	0	66	0	27	126	0
Queue Length 95th (ft)	80	39	48	42	34	108	0	61	207	24
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	3050	2517	1143	1422	864	5037	1349	1761	3539	1482
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.04	0.18	0.03	0.13	0.17	0.02	0.11	0.33	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	1	45	1	5	891	28	44	1481	4
v/c Ratio	0.03	0.00	0.15	0.01	0.03	0.30	0.03	0.25	0.55	0.00
Control Delay	32.5	0.0	31.2	31.0	0.2	10.0	0.0	32.1	6.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	0.0	31.2	31.0	0.2	10.0	0.0	32.1	6.0	0.0
Queue Length 50th (ft)	1	0	8	0	0	69	0	17	107	0
Queue Length 95th (ft)	9	0	24	5	0	125	0	46	235	0
Internal Link Dist (ft)		226		372		97			363	
Turn Bay Length (ft)	190		285		185		45	245		340
Base Capacity (vph)	532	1108	1301	1120	797	4277	1306	1152	3471	1189
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.03	0.00	0.01	0.21	0.02	0.04	0.43	0.00

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	29	11	96	899	1771
v/c Ratio	0.11	0.08	0.41	0.30	0.55
Control Delay	39.5	22.4	40.6	1.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	22.4	40.6	1.8	8.6
Queue Length 50th (ft)	7	0	47	46	173
Queue Length 95th (ft)	19	13	85	52	183
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	70	90	215		
Base Capacity (vph)	1726	840	934	3438	3739
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.10	0.26	0.47

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	104	246	243	117	477	461	780	106	702	173
v/c Ratio	0.49	0.33	0.47	0.50	0.63	0.60	0.68	0.50	0.56	0.37
Control Delay	56.1	39.2	8.5	55.0	39.1	42.8	34.9	56.4	38.3	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	39.2	8.5	55.0	39.1	42.8	34.9	56.4	38.3	14.5
Queue Length 50th (ft)	66	73	0	74	134	143	232	67	150	25
Queue Length 95th (ft)	139	130	50	152	221	231	355	141	227	82
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	498	1727	866	793	2137	1354	1787	472	2191	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.14	0.28	0.15	0.22	0.34	0.44	0.22	0.32	0.24

Intersection Summary

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	56	78	96	34	101	444	33	362	44
v/c Ratio	0.26	0.26	0.32	0.10	0.32	0.41	0.17	0.41	0.06
Control Delay	25.7	9.3	25.5	4.5	25.2	11.0	26.9	15.2	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	9.3	25.5	4.5	25.2	11.0	26.9	15.2	4.3
Queue Length 50th (ft)	15	0	27	0	28	56	9	89	0
Queue Length 95th (ft)	53	33	79	13	81	217	38	188	16
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	700	794	949	923	983	1507	797	1578	1283
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.10	0.04	0.10	0.29	0.04	0.23	0.03

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	197	279	289	94	50	476	588	156	465
v/c Ratio	0.18	0.52	0.67	0.68	0.20	0.34	0.43	0.81	0.59	0.32
Control Delay	63.5	40.5	51.2	51.4	10.2	67.6	33.0	26.4	61.6	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	40.5	51.2	51.4	10.2	67.6	33.0	26.4	61.6	24.8
Queue Length 50th (ft)	18	44	193	201	2	35	141	187	108	121
Queue Length 95th (ft)	62	112	395	408	50	102	260	455	243	220
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	408	934	944	964	924	334	1931	1022	574	2325
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.21	0.30	0.30	0.10	0.15	0.25	0.58	0.27	0.20

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	152	876	20	694	603	14	25	153	155	103
v/c Ratio	0.73	0.60	0.21	0.67	0.84	0.03	0.05	0.65	0.65	0.33
Control Delay	75.8	32.6	65.9	42.9	25.5	38.4	30.6	64.5	64.3	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.8	32.6	65.9	42.9	25.5	38.4	30.6	64.5	64.3	9.7
Queue Length 50th (ft)	119	265	16	260	171	8	11	123	125	0
Queue Length 95th (ft)	#239	417	45	341	330	28	36	205	207	39
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	222	1471	283	1435	847	512	460	450	456	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.60	0.07	0.48	0.71	0.03	0.05	0.34	0.34	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	734	482	396	1128	51	237
v/c Ratio	0.51	0.53	0.81	0.43	0.20	0.76
Control Delay	23.7	5.1	42.7	5.4	31.4	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	5.1	42.7	5.4	31.4	35.6
Queue Length 50th (ft)	153	0	200	96	25	73
Queue Length 95th (ft)	#289	75	270	182	50	135
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1446	904	546	2614	523	536
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.53	0.73	0.43	0.10	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	196	580	874	567	535	519
v/c Ratio	0.76	0.31	0.74	0.91	0.77	0.72
Control Delay	53.8	12.4	30.4	47.2	22.7	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	12.4	30.4	47.2	22.7	18.4
Queue Length 50th (ft)	102	90	224	300	167	130
Queue Length 95th (ft)	#177	124	301	#508	#317	260
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	303	1861	1187	633	701	728
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.31	0.74	0.90	0.76	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	56	1519	11	743	161	29
v/c Ratio	0.26	0.66	0.08	0.37	0.51	0.10
Control Delay	32.8	10.4	33.6	10.4	31.9	3.4
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	32.8	10.5	33.6	10.4	31.9	3.4
Queue Length 50th (ft)	19	147	4	92	53	0
Queue Length 95th (ft)	63	382	22	158	135	7
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	685	2681	570	2687	665	564
Starvation Cap Reductn	0	255	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.63	0.02	0.28	0.24	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	570	796	13	580	164	32	17	68
v/c Ratio	0.97	0.38	0.08	0.64	0.54	0.10	0.17	0.33
Control Delay	65.0	15.3	41.1	33.3	43.2	21.0	50.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.0	15.3	41.1	33.3	43.2	21.0	50.2	8.7
Queue Length 50th (ft)	328	104	7	148	90	7	10	0
Queue Length 95th (ft)	#764	345	26	253	167	34	36	23
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	588	2342	588	2273	588	579	467	591
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.34	0.02	0.26	0.28	0.06	0.04	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	133	385	126	166	319	365	164	54	385
v/c Ratio	0.27	0.52	0.70	0.49	0.62	0.61	0.46	0.23	0.34	0.66
Control Delay	35.9	41.2	11.5	39.9	41.0	32.9	22.5	4.6	44.1	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	41.2	11.5	39.9	41.0	32.9	22.5	4.6	44.1	35.8
Queue Length 50th (ft)	30	62	0	59	71	134	133	0	26	87
Queue Length 95th (ft)	74	132	79	125	151	#314	280	42	70	155
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	604	642	793	610	612	524	927	824	567	1688
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.21	0.49	0.21	0.27	0.61	0.39	0.20	0.10	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	58	91	479	23	463	85	413	496
v/c Ratio	0.20	0.37	0.58	0.13	0.72	0.15	0.76	0.37
Control Delay	19.7	28.1	8.6	29.9	23.3	4.4	35.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	28.1	8.6	29.9	23.3	4.4	35.3	6.6
Queue Length 50th (ft)	12	28	39	7	134	1	128	53
Queue Length 95th (ft)	46	77	145	31	249	24	#384	205
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	654	560	831	552	1251	1037	542	1350
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.16	0.58	0.04	0.37	0.08	0.76	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	115	81	112	101	112	606	49	203	354
v/c Ratio	0.73	0.12	0.52	0.39	0.54	0.60	0.32	0.48	0.57
Control Delay	59.4	7.3	47.5	23.9	48.1	27.0	47.2	32.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	7.3	47.5	23.9	48.1	27.0	47.2	32.5	7.9
Queue Length 50th (ft)	52	0	56	20	56	139	25	92	7
Queue Length 95th (ft)	#203	37	131	77	131	217	72	177	78
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	157	661	563	576	437	1731	454	929	965
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.12	0.20	0.18	0.26	0.35	0.11	0.22	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	298	166	299	307	49	130	749	270	26	484	108
v/c Ratio	0.59	0.71	0.34	0.63	0.67	0.10	0.60	0.94	0.26	0.24	0.81	0.18
Control Delay	59.4	50.3	7.6	52.6	46.2	0.5	59.7	54.3	3.7	58.7	48.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	50.3	7.6	52.6	46.2	0.5	59.7	54.3	3.7	58.7	48.7	1.4
Queue Length 50th (ft)	87	193	0	105	195	0	89	~588	15	18	318	0
Queue Length 95th (ft)	163	324	54	166	325	0	166	#965	58	51	#616	6
Internal Link Dist (ft)		429			1915			582			10000	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	328	513	559	782	600	572	395	797	1170	304	600	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.58	0.30	0.38	0.51	0.09	0.33	0.94	0.23	0.09	0.81	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	148	117	110	1078	103	777
v/c Ratio	0.32	0.34	0.28	0.52	0.48	0.30
Control Delay	3.5	27.2	8.1	12.2	35.6	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	27.2	8.1	12.2	35.6	4.4
Queue Length 50th (ft)	0	38	0	139	36	51
Queue Length 95th (ft)	19	92	38	248	89	91
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)	860	100	1000		170	
Base Capacity (vph)	890	860	814	2257	558	3148
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.14	0.14	0.48	0.18	0.25

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	178	28	306	114	26	35	232	913	73	65	934	85
v/c Ratio	0.52	0.15	0.54	0.50	0.19	0.18	0.65	0.50	0.09	0.37	0.70	0.13
Control Delay	47.3	49.1	9.7	53.0	54.9	2.0	48.1	18.4	5.4	54.6	30.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	47.3	49.1	9.7	53.0	54.9	2.0	48.1	18.5	5.4	54.6	30.8	6.5
Queue Length 50th (ft)	106	16	0	69	16	0	136	200	3	40	257	1
Queue Length 95th (ft)	217	53	47	153	53	0	267	325	30	101	427	36
Internal Link Dist (ft)		707			453			403			1015	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	570	577	1073	553	577	542	815	2719	1204	373	1864	869
Starvation Cap Reductn	0	0	0	0	0	0	0	502	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.05	0.29	0.21	0.05	0.06	0.28	0.41	0.06	0.17	0.50	0.10

Intersection Summary

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	82	120	485	167	153	289	971	279	1244	100
v/c Ratio	0.51	0.22	0.55	0.64	0.44	0.77	0.31	0.26	0.69	0.16
Control Delay	55.9	3.5	31.8	47.8	11.1	49.9	9.1	1.8	29.6	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	3.5	31.8	47.8	11.1	49.9	9.1	1.8	29.6	9.8
Queue Length 50th (ft)	47	0	125	89	0	163	89	0	222	8
Queue Length 95th (ft)	110	22	197	186	60	288	152	34	378	52
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	409	724	2295	671	672	608	3890	1286	1943	682
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.17	0.21	0.25	0.23	0.48	0.25	0.22	0.64	0.15

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	409	237	63	111	327	1356	93	295	811	366
v/c Ratio	0.40	0.54	0.25	0.50	0.76	0.72	0.17	0.38	0.40	0.34
Control Delay	25.5	40.6	11.6	45.3	33.8	28.3	7.3	29.2	10.0	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	40.6	11.6	45.3	33.8	28.3	7.3	29.2	10.0	1.9
Queue Length 50th (ft)	82	58	0	52	103	171	2	61	101	0
Queue Length 95th (ft)	154	119	34	126	248	268	38	124	178	35
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	2253	1659	765	938	589	3714	990	1138	3127	1466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.14	0.08	0.12	0.56	0.37	0.09	0.26	0.26	0.25

Intersection Summary

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	1	82	12	2	1448	61	28	989	1
v/c Ratio	0.03	0.00	0.23	0.02	0.01	0.44	0.06	0.17	0.40	0.00
Control Delay	36.2	0.0	33.4	0.0	36.5	8.3	1.8	35.5	6.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	0.0	33.4	0.0	36.5	8.3	1.8	35.5	6.5	0.0
Queue Length 50th (ft)	2	0	15	0	1	61	0	10	59	0
Queue Length 95th (ft)	14	0	45	0	8	242	13	42	229	0
Internal Link Dist (ft)		226				97			363	
Turn Bay Length (ft)	190		285	185	90		45	245		340
Base Capacity (vph)	780	1084	1416	1199	780	4400	1380	1395	3544	1568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.06	0.01	0.00	0.33	0.04	0.02	0.28	0.00

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	125	78	27	1244	990
v/c Ratio	0.23	0.25	0.11	0.55	0.36
Control Delay	19.8	8.3	21.2	6.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	8.3	21.2	6.3	8.1
Queue Length 50th (ft)	14	0	6	83	36
Queue Length 95th (ft)	39	29	27	135	110
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	70	90	215		
Base Capacity (vph)	2842	1325	1465	3539	5029
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.04	0.06	0.02	0.35	0.20

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	241	324	369	55	378	330	1016	154	708	173
v/c Ratio	0.63	0.29	0.49	0.36	0.62	0.55	0.99	0.59	0.53	0.35
Control Delay	49.1	30.3	5.6	58.5	40.9	46.9	67.2	55.9	38.0	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	30.3	5.6	58.5	40.9	46.9	67.2	55.9	38.0	14.4
Queue Length 50th (ft)	151	89	0	37	106	108	~402	101	157	26
Queue Length 95th (ft)	287	155	73	91	187	187	#659	199	243	98
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	496	1623	923	752	1970	1272	1791	492	2120	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.20	0.40	0.07	0.19	0.26	0.57	0.31	0.33	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	92	131	113	35	49	678	22	489	13
v/c Ratio	0.36	0.32	0.45	0.10	0.23	0.64	0.11	0.51	0.02
Control Delay	29.0	7.9	31.3	4.5	31.7	14.7	32.5	14.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	7.9	31.3	4.5	31.7	14.7	32.5	14.5	0.1
Queue Length 50th (ft)	28	0	35	0	16	117	7	129	0
Queue Length 95th (ft)	83	43	100	13	56	402	33	272	0
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	664	849	647	773	798	1493	903	1502	1119
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.15	0.17	0.05	0.06	0.45	0.02	0.33	0.01

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	113	405	409	221	46	631	547	105	662
v/c Ratio	0.20	0.42	0.74	0.74	0.36	0.36	0.52	0.80	0.54	0.47
Control Delay	71.8	63.1	51.3	51.1	14.4	76.0	37.7	33.2	73.5	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	63.1	51.3	51.1	14.4	76.0	37.7	33.2	73.5	32.3
Queue Length 50th (ft)	23	45	331	334	44	39	230	265	89	227
Queue Length 95th (ft)	65	94	552	556	128	97	364	521	183	356
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	394	777	827	836	852	293	1707	882	512	2141
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.15	0.49	0.49	0.26	0.16	0.37	0.62	0.21	0.31

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	181	696	38	888	434	51	31	255	255	226
v/c Ratio	0.91	0.53	0.36	0.83	0.73	0.11	0.07	0.77	0.76	0.46
Control Delay	104.6	38.4	75.0	53.9	29.1	44.6	32.1	69.4	68.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.6	38.4	75.0	53.9	29.1	44.6	32.1	69.4	68.8	8.6
Queue Length 50th (ft)	170	270	35	399	179	37	14	240	238	0
Queue Length 95th (ft)	#338	369	76	513	333	79	45	347	346	69
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	200	1308	258	1284	669	454	460	423	426	568
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.53	0.15	0.69	0.65	0.11	0.07	0.60	0.60	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	719	497	569	1126	45	315
v/c Ratio	0.69	0.62	0.90	0.46	0.13	0.82
Control Delay	35.7	6.8	47.9	7.4	29.1	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	6.8	47.9	7.4	29.1	41.8
Queue Length 50th (ft)	206	0	298	129	22	125
Queue Length 95th (ft)	#327	89	#531	228	46	200
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1046	807	645	2464	503	512
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.62	0.88	0.46	0.09	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	220	570	1308	386	377	354
v/c Ratio	0.82	0.27	0.89	0.77	0.74	0.55
Control Delay	63.7	10.1	37.1	40.1	32.0	9.6
Queue Delay	0.0	0.0	1.2	0.0	0.0	0.0
Total Delay	63.7	10.1	38.3	40.1	32.0	9.6
Queue Length 50th (ft)	126	82	402	214	175	37
Queue Length 95th (ft)	#243	123	#584	311	278	113
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	286	2147	1462	586	586	713
Starvation Cap Reductn	0	0	46	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.27	0.92	0.66	0.64	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	57	1130	22	1227	95	21
v/c Ratio	0.23	0.47	0.11	0.54	0.33	0.07
Control Delay	30.4	8.1	31.4	11.1	29.9	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	8.2	31.4	11.1	29.9	0.9
Queue Length 50th (ft)	19	77	7	170	31	0
Queue Length 95th (ft)	61	232	32	286	87	3
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	825	2820	825	2880	794	735
Starvation Cap Reductn	0	316	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.45	0.03	0.43	0.12	0.03

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	195	792	20	699	126	28	85	379
v/c Ratio	0.59	0.49	0.10	0.63	0.45	0.10	0.46	0.70
Control Delay	45.6	22.3	42.1	31.1	43.7	17.6	50.7	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	22.3	42.1	31.1	43.7	17.6	50.7	12.5
Queue Length 50th (ft)	96	114	10	163	63	1	42	0
Queue Length 95th (ft)	243	386	40	351	158	29	126	100
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	630	2458	630	2498	630	590	486	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.32	0.03	0.28	0.20	0.05	0.17	0.47

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	54	217	183	108	220	254	142	27	307
v/c Ratio	0.30	0.27	0.58	0.55	0.32	0.55	0.33	0.20	0.17	0.51
Control Delay	33.8	33.0	12.0	32.3	25.7	29.4	16.9	4.5	34.5	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	33.0	12.0	32.3	25.7	29.4	16.9	4.5	34.5	27.9
Queue Length 50th (ft)	22	19	0	63	32	74	55	0	10	53
Queue Length 95th (ft)	60	54	43	133	78	147	143	27	34	101
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	759	757	813	812	792	718	1209	1009	746	2233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.27	0.23	0.14	0.31	0.21	0.14	0.04	0.14

Intersection Summary

2: Taylor Rd & Horseshoe Bar Rd

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	116	295	17	317	98	356	407
v/c Ratio	0.13	0.43	0.33	0.09	0.58	0.19	0.61	0.32
Control Delay	16.9	25.4	2.2	25.8	21.3	5.0	24.4	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	25.4	2.2	25.8	21.3	5.0	24.4	6.8
Queue Length 50th (ft)	7	32	0	5	84	0	91	42
Queue Length 95th (ft)	28	79	28	22	159	26	#249	155
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	685	590	907	596	1377	1127	585	1350
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.20	0.33	0.03	0.23	0.09	0.61	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	112	65	72	106	154	458	34	151	353
v/c Ratio	0.65	0.10	0.39	0.50	0.61	0.45	0.25	0.46	0.61
Control Delay	47.3	7.1	42.9	36.8	44.8	23.6	44.1	34.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	7.1	42.9	36.8	44.8	23.6	44.1	34.2	8.4
Queue Length 50th (ft)	39	0	31	34	67	93	15	65	0
Queue Length 95th (ft)	#175	30	87	99	156	150	52	134	65
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	171	635	564	578	460	1788	452	942	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.10	0.13	0.18	0.33	0.26	0.08	0.16	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	207	128	236	179	26	131	331	228	31	359	63
v/c Ratio	0.39	0.54	0.28	0.50	0.36	0.05	0.53	0.45	0.22	0.21	0.68	0.11
Control Delay	49.2	40.3	4.0	43.3	34.0	0.2	48.0	24.9	2.1	49.3	38.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	40.3	4.0	43.3	34.0	0.2	48.0	24.9	2.1	49.3	38.1	0.4
Queue Length 50th (ft)	39	104	0	63	85	0	68	143	0	17	175	0
Queue Length 95th (ft)	103	216	25	129	183	0	157	283	34	55	352	0
Internal Link Dist (ft)		429			1915			582			10000	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	406	654	653	1005	756	718	493	862	1254	418	756	735
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.32	0.20	0.23	0.24	0.04	0.27	0.38	0.18	0.07	0.47	0.09

Intersection Summary

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	72	118	57	699	79	627
v/c Ratio	0.13	0.29	0.15	0.38	0.37	0.27
Control Delay	0.5	19.8	4.9	10.4	26.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.5	19.8	4.9	10.4	26.9	5.1
Queue Length 50th (ft)	0	27	0	69	20	36
Queue Length 95th (ft)	0	79	18	136	63	70
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)	860	100	1000		170	
Base Capacity (vph)	1063	1059	889	2744	660	3445
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.11	0.06	0.25	0.12	0.18

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	24	213	123	25	24	206	510	102	67	647	103
v/c Ratio	0.32	0.14	0.47	0.45	0.16	0.10	0.56	0.33	0.14	0.32	0.59	0.19
Control Delay	34.2	40.7	10.0	38.5	41.0	0.9	35.7	16.6	4.2	40.2	26.3	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	40.7	10.0	38.5	41.0	0.9	35.7	16.6	4.2	40.2	26.3	8.3
Queue Length 50th (ft)	52	11	0	53	11	0	86	84	0	29	133	5
Queue Length 95th (ft)	129	41	38	130	42	0	191	153	30	83	243	45
Internal Link Dist (ft)		707			453			403			1015	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	697	734	1247	704	707	702	1047	3245	1442	469	2371	1085
Starvation Cap Reductn	0	0	0	0	0	0	0	120	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.03	0.17	0.17	0.04	0.03	0.20	0.16	0.07	0.14	0.27	0.09

Intersection Summary

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	424	178	153	354	581	255	917	85
v/c Ratio	0.47	0.45	0.44	0.62	0.42	0.70	0.19	0.25	0.72	0.18
Control Delay	51.7	7.9	27.1	46.5	10.6	39.0	9.1	2.0	34.2	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	7.9	27.1	46.5	10.6	39.0	9.1	2.0	34.2	9.4
Queue Length 50th (ft)	44	29	94	94	0	171	49	0	168	2
Queue Length 95th (ft)	108	77	163	200	58	347	91	34	268	41
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	455	811	2469	770	718	682	4089	1310	2179	756
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.37	0.17	0.23	0.21	0.52	0.14	0.19	0.42	0.11

Intersection Summary

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	385	290	52	110	345	704	93	445	509	226
v/c Ratio	0.32	0.53	0.18	0.45	0.73	0.57	0.23	0.55	0.29	0.25
Control Delay	18.0	31.9	7.0	36.2	25.5	27.2	8.4	25.9	10.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	31.9	7.0	36.2	25.5	27.2	8.4	25.9	10.4	2.3
Queue Length 50th (ft)	57	56	0	41	80	73	0	80	57	0
Queue Length 95th (ft)	114	118	22	107	196	133	39	147	105	32
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	2669	1926	877	1123	704	4412	1192	1348	3395	1511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.15	0.06	0.10	0.49	0.16	0.08	0.33	0.15	0.15

Intersection Summary

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	3	72	1	19	1	742	79	32	633	5
v/c Ratio	0.01	0.01	0.14	0.00	0.06	0.00	0.25	0.08	0.13	0.28	0.00
Control Delay	23.0	0.0	20.6	22.0	0.4	23.0	9.2	4.2	21.7	7.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	0.0	20.6	22.0	0.4	23.0	9.2	4.2	21.7	7.4	0.0
Queue Length 50th (ft)	1	0	7	0	0	0	24	0	6	31	0
Queue Length 95th (ft)	8	0	29	4	0	4	112	24	34	137	0
Internal Link Dist (ft)		226		372			97			363	
Turn Bay Length (ft)	190		285		185	90		45	245		340
Base Capacity (vph)	1256	1461	2343	1652	1416	1256	5010	1576	1617	3539	1581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.03	0.00	0.01	0.00	0.15	0.05	0.02	0.18	0.00

Intersection Summary

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	40	22	16	827	746
v/c Ratio	0.08	0.08	0.06	0.30	0.20
Control Delay	17.3	9.7	17.7	3.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	9.7	17.7	3.3	4.8
Queue Length 50th (ft)	5	0	4	40	23
Queue Length 95th (ft)	14	14	16	66	73
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	70	90	215		
Base Capacity (vph)	3137	1492	1665	3539	5007
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.01	0.23	0.15

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	130	192	193	42	282	172	597	107	471	94
v/c Ratio	0.48	0.20	0.34	0.24	0.49	0.33	0.56	0.43	0.32	0.18
Control Delay	39.3	26.7	6.7	40.5	24.7	34.1	26.0	39.7	23.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	26.7	6.7	40.5	24.7	34.1	26.0	39.7	23.2	5.4
Queue Length 50th (ft)	59	41	0	19	43	39	125	49	64	0
Queue Length 95th (ft)	130	81	54	58	95	81	217	112	110	31
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	689	2298	1073	1034	2721	1749	2502	689	2971	923
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.08	0.18	0.04	0.10	0.10	0.24	0.16	0.16	0.10

Intersection Summary

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	23	20	29	20	362	23	456	69
v/c Ratio	0.26	0.06	0.06	0.08	0.08	0.32	0.10	0.38	0.07
Control Delay	20.9	2.1	18.6	3.4	22.1	8.2	22.0	8.7	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	2.1	18.6	3.4	22.1	8.2	22.0	8.7	3.7
Queue Length 50th (ft)	13	0	4	0	4	39	4	52	1
Queue Length 95th (ft)	60	5	23	9	26	158	28	202	22
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	960	1090	1073	1118	1188	1699	1058	1763	1470
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.02	0.02	0.03	0.02	0.21	0.02	0.26	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	74	225	227	107	15	473	337	86	425
v/c Ratio	0.12	0.19	0.49	0.50	0.21	0.09	0.44	0.55	0.33	0.30
Control Delay	40.1	30.7	30.9	30.9	7.0	41.1	25.0	15.8	38.1	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	30.7	30.9	30.9	7.0	41.1	25.0	15.8	38.1	17.5
Queue Length 50th (ft)	10	12	95	96	0	7	95	55	37	58
Queue Length 95th (ft)	41	41	208	210	40	30	181	170	100	144
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	800	1537	1356	1359	1280	572	2799	1293	953	3225
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.05	0.17	0.17	0.08	0.03	0.17	0.26	0.09	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	435	23	414	444	46	39	211	214	188
v/c Ratio	0.76	0.39	0.21	0.58	0.68	0.08	0.07	0.67	0.68	0.43
Control Delay	70.2	34.0	59.5	45.4	9.5	32.7	18.7	55.1	55.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	34.0	59.5	45.4	9.5	32.7	18.7	55.1	55.4	8.8
Queue Length 50th (ft)	133	138	17	146	0	24	8	153	155	0
Queue Length 95th (ft)	#294	212	48	216	96	62	40	253	257	61
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	242	1405	309	1567	911	554	532	521	523	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.31	0.07	0.26	0.49	0.08	0.07	0.40	0.41	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: I-80 WB Ramps & Rocklin Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	491	434	397	743	31	181
v/c Ratio	0.28	0.44	0.83	0.25	0.24	0.64
Control Delay	16.2	3.6	46.5	2.2	43.6	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	3.6	46.5	2.2	43.6	17.1
Queue Length 50th (ft)	84	0	219	32	18	1
Queue Length 95th (ft)	154	61	294	67	43	61
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1742	987	605	2921	484	571
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.44	0.66	0.25	0.06	0.32

Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	162	388	759	326	318	296
v/c Ratio	0.70	0.17	0.47	0.72	0.72	0.48
Control Delay	54.5	8.2	19.7	39.5	36.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	8.2	19.7	39.5	36.3	5.6
Queue Length 50th (ft)	93	45	156	183	167	0
Queue Length 95th (ft)	156	81	249	253	243	55
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	286	2268	1624	586	561	711
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.17	0.47	0.56	0.57	0.42

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	64	691	13	643	99	17
v/c Ratio	0.21	0.30	0.05	0.34	0.29	0.05
Control Delay	20.5	6.3	21.2	10.5	20.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	6.3	21.2	10.5	20.4	0.4
Queue Length 50th (ft)	15	35	3	66	22	0
Queue Length 95th (ft)	47	117	17	122	64	2
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	1058	3374	1058	3420	1058	970
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.20	0.01	0.19	0.09	0.02

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	35	608	20	568	102	17	22	89
v/c Ratio	0.15	0.39	0.09	0.39	0.27	0.05	0.13	0.32
Control Delay	31.2	14.8	32.1	17.2	22.8	11.5	32.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	14.8	32.1	17.2	22.8	11.5	32.7	10.9
Queue Length 50th (ft)	9	60	5	56	25	0	6	0
Queue Length 95th (ft)	48	207	33	198	81	15	36	39
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	1011	3192	1011	3248	1011	864	791	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.19	0.02	0.17	0.10	0.02	0.03	0.09

Intersection Summary

Existing Plus Project Conditions

Project Driveway Option A

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	200	970	350	280	490	-	65	215	150	95	585	-
2	Taylor Road & Horseshoe Bar Road	100	400	125	190	380	-	-	115	-	-	160	160
3	Horseshoe Bar Road & I-80 Westbound Ramp	85	680	-	160	450	95	-	935	250	275	95	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	2,350	100	-	685	-	-	-	-	-	1,080	-
5	Barton Road & Brace Road	-	2,895	-	-	-	-	-	1,980	-	-	560	-
6	Sierra College Boulevard & Taylor Road	210	550	550	210	1,500	450	150	900	250	215	2,060	215
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	60	230	150
9	Sierra College Boulevard & I-80 WB Ramps	200	1,530	325	-	370	150	530	-	530	740	1,320	740
10	Sierra College Boulevard & I-80 EB Ramps	-	710	280	250	1,530	500	1,315	1,315	205	345	-	330
11	Sierra College Boulevard & Schriber Way	-	395	-	-	300	-	-	-	-	-	-	415
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	90	1,675	45	245	710	340	190	275	-	285	745	185
13	Sierra College Boulevard & Stadium Dwy	215	1,580	-	-	1,690	-	70	-	90	-	-	-
14	Sierra College Boulevard & Rocklin Road	245	650	-	245	1,575	175	240	925	925	315	1,325	-
15	Pacific Street & Dominguez Road/Delmar Avenue	210	1,860	-	200	850	150	-	700	315	-	1,935	140
16	Pacific Street & Rocklin Road	265	420	110	230	410	-	130	285	-	250	330	330
17	Granite Drive & Rocklin Road	100	140	-	325	625	625	225	675	-	135	650	150
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	635	1,165	-	-	580	280	300	555	-
19	I-80 Eastbound Ramps & Rocklin Road	455	1,115	455	-	-	-	170	520	-	-	370	-
20	Aguilar Road & Rocklin Road	320	-	320	-	-	-	75	400	-	85	1,260	-
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
22	Dominguez Road & Granite Driive	220	1,390	-	-	730	-	370	-	50	-	-	-
23	El Don Drive & Rocklin Road	140	530	-	-	580	95	410	1,260	-	265	1,430	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1900	600	465	2500	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	4500	-	100	1300	-	-	-	-	1450	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	105	1100	210	105	3100	-	-	85	30	-	910	30
29	Taylor Road & English Colony Way-Rock Springs Road	150	1,900	-	140	350	115	-	560	30	-	940	-
30	Taylor Road & Penryn Road (North	85	170	-	-	555	-	55	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	2600	-	85	180	-	-	-	-	495	-	-
32	Taylor Road & Del Oro High School North Lot	-	185	-	70	1600	-	-	-	-	200	-	45
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Drop Off	150	300	-	90	190	-	-	50	-	-	75	-
34	Taylor Road & Del Oro High School South Lot	-	1200	-	150	300	-	-	-	-	65	-	65
35	Taylor Road & Rippey Road	140	465	-	-	610	-	3500	-	-	-	-	-
36	Taylor Road & Webb Street	185	370	-	160	500	105	-	-	1070	-	190	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

ExistingP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**267**	384	34	73	220	-	**213**	152	62	**168**	295	-
2	Taylor Road & Horseshoe Bar Road	7	173	18	**#349**	122	-	-	48	-	-	50	99
3	Horseshoe Bar Road & I-80 Westbound Ramp	**207**	212	-	41	211	**132**	-	#194	48	81	**100**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	363	-
5	Barton Road & Brace Road	-	15	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	190	251	29	55	#842	16	96	202	-	127	203	-
7	Sierra College Boulevard & Brace Road	-	116	5	#91	112	-	-	-	3	75	-	19
8	Sierra College Boulevard & Granite Drive	**269**	217	33	131	434	40	114	49	33	**194**	70	-
9	Sierra College Boulevard & I-80 WB Ramps	87	89	24	-	248	7	14	-	21	220	144	55
10	Sierra College Boulevard & I-80 EB Ramps	-	111	-	61	211	27	93	40	48	42	-	36
11	Sierra College Boulevard & Schriber Way	-	-	-	-	-	-	-	-	-	-	-	9
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	-	127	-	46	238	-	9	-	-	24	5	-
13	Sierra College Boulevard & Stadium Dwy	85	53	-	-	185	-	19	-	13	-	-	-
14	Sierra College Boulevard & Rocklin Road	234	363	-	142	231	84	142	130	50	153	222	-
15	Pacific Street & Dominguez Road/Delmar Avenue	82	222	-	38	194	16	-	54	33	-	79	13
16	Pacific Street & Rocklin Road	102	263	**464**	**244**	225	-	69	112	-	**397**	**410**	50
17	Granite Drive & Rocklin Road	28	36	-	205	207	43	**#245**	417	-	45	341	**330**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	50	135	-	-	#289	75	270	182	-
19	I-80 Eastbound Ramps & Rocklin Road	**#508**	#317	260	-	-	-	**#177**	124	-	-	301	-
20	Aguilar Road & Rocklin Road	136	-	8	-	-	-	63	386	-	24	158	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	5	-	-	-	-	-	10	-	5	-	-	-
23	El Don Drive & Rocklin Road	**167**	34	-	-	36	23	**#765**	347	-	27	253	-
24	Sierra College Boulevard & Project Driveway	-	58	10	41	101	-	-	-	-	38	-	21
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	75	8	-	-	-	-	70	253	35	68	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	8	-	-	-	-	-	10	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	-	-	-	30	-
29	Taylor Road & English Colony Way-Rock Springs Road	25	75	-	-	168	25	-	40	**65**	-	55	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	33	-	-	-	-	-	395	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	25	-	-	-	-	-	58	-	18
33	Taylor Road & First Baptist Church Driveway/Del Oro High School	-	-	-	15	-	-	-	-	-	-	**498**	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	18	-	-	-	-	-	**150**	-	15
35	Taylor Road & Rippey Road	8	-	-	-	-	-	10	-	-	-	-	-
36	Taylor Road & Webb Street	13	-	-	3	-	-	-	-	48	-	5	-
37	Project Driveway East & Brace Road	-	0	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#329**	290	42	71	161	-	**75**	134	81	**130**	152	-
2	Taylor Road & Horseshoe Bar Road	32	265	25	**#396**	219	-	-	47	-	-	79	**161**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**131**	217	-	72	177	**78**	-	#203	37	131	77	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	388	-
5	Barton Road & Brace Road	-	18	-	-	-	-	-	-	-	-	3	-
6	Sierra College Boulevard & Taylor Road	193	**#1004**	62	52	#677	6	**166**	338	58	181	334	-
7	Sierra College Boulevard & Brace Road	-	217	14	#102	111	-	-	-	27	#93	-	30
8	Sierra College Boulevard & Granite Drive	**269**	**489**	33	102	**#691**	44	**227**	53	47	154	53	-
9	Sierra College Boulevard & I-80 WB Ramps	**314**	215	39	-	**#641**	56	117	-	21	195	256	132
10	Sierra College Boulevard & I-80 EB Ramps	-	275	38	125	187	40	198	120	34	126	-	#293
11	Sierra College Boulevard & Schriber Way	-	-	-	-	-	-	-	-	-	-	-	9
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	8	250	13	43	240	-	15	-	-	46	-	-
13	Sierra College Boulevard & Stadium Dwy	27	142	-	-	115	-	39	-	30	-	-	-
14	Sierra College Boulevard & Rocklin Road	188	**#684**	-	205	251	105	**297**	156	74	91	189	-
15	Pacific Street & Dominguez Road/Delmar Avenue	57	422	-	33	288	-	-	85	44	-	102	13
16	Pacific Street & Rocklin Road	97	370	**533**	183	372	-	83	94	-	**560**	**562**	129
17	Granite Drive & Rocklin Road	**79**	45	-	**347**	346	72	**#363**	369	-	76	513	**333**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	46	200	-	-	#327	89	**#531**	228	-
19	I-80 Eastbound Ramps & Rocklin Road	311	278	113	-	-	-	**#243**	123	-	-	**#584**	-
20	Aguilar Road & Rocklin Road	87	-	4	-	-	-	61	234	-	34	286	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	2	-	-	-
22	Dominguez Road & Granite Driive	3	-	-	-	-	-	15	-	5	-	-	-
23	El Don Drive & Rocklin Road	**159**	31	-	-	127	**99**	244	389	-	46	353	-
24	Sierra College Boulevard & Project Driveway	-	159	30	101	153	-	-	-	-	100	-	37
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	438	25	-	-	-	-	103	68	18	83	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	13	-	-	-	-	-	25	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	3	-	-	30	-
29	Taylor Road & English Colony Way-Rock Springs Road	20	88	-	-	28	13	-	28	15	-	18	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	10	-	-	-	-	-	60	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	8	-	0
33	Taylor Road & First Baptist Church Driveway/Del Oro High School	-	-	-	-	-	-	-	-	-	-	10	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	45	-	5
35	Taylor Road & Rippey Road	3	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	25	-	-	-	-	-	-	-	33	-	10	-
37	Project Driveway East & Brace Road	-	0	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	162	159	28	36	114	-	63	56	45	**145**	82	-
2	Taylor Road & Horseshoe Bar Road	23	187	25	**#269**	182	-	-	29	-	-	83	30
3	Horseshoe Bar Road & I-80 Westbound Ramp	**156**	150	-	52	134	65	-	#175	30	87	**99**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	5	-	-	-	-	-	185	-
5	Barton Road & Brace Road	-	43	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	210	344	37	59	#470	-	110	234	59	163	191	-
7	Sierra College Boulevard & Brace Road	-	140	11	#77	96	-	-	-	-	#76	-	3
8	Sierra College Boulevard & Granite Drive	230	310	35	98	446	58	171	46	41	154	48	-
9	Sierra College Boulevard & I-80 WB Ramps	**#464**	160	42	-	**#527**	46	124	-	84	168	320	105
10	Sierra College Boulevard & I-80 EB Ramps	-	145	38	154	119	41	157	121	22	110	-	237
11	Sierra College Boulevard & Schriber Way	-	-	-	-	-	-	-	-	-	-	-	11
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	5	122	24	34	152	-	8	-	-	30	4	-
13	Sierra College Boulevard & Stadium Dwy	16	73	-	-	79	-	14	-	14	-	-	-
14	Sierra College Boulevard & Rocklin Road	82	242	-	121	122	37	143	82	54	58	98	-
15	Pacific Street & Dominguez Road/Delmar Avenue	27	180	-	29	224	22	-	62	5	-	24	9
16	Pacific Street & Rocklin Road	32	201	**194**	107	168	-	69	42	-	228	228	42
17	Granite Drive & Rocklin Road	62	40	-	253	257	63	**#333**	212	-	48	216	96
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	43	61	-	-	154	61	294	67	-
19	I-80 Eastbound Ramps & Rocklin Road	253	243	55	-	-	-	156	81	-	-	249	-
20	Aguilar Road & Rocklin Road	64	-	5	-	-	-	47	118	-	20	122	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	5	-	-	-	-	-	10	-	5	-	-	-
23	El Don Drive & Rocklin Road	82	18	-	-	36	39	49	210	-	41	200	-
24	Sierra College Boulevard & Project Driveway	-	91	100	#185	103	-	-	-	-	124	-	43
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	118	25	-	3	-	-	75	63	175	55	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	3	-	-	-	-	-	13	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	3	-	-	23	-
29	Taylor Road & English Colony Way-Rock Springs Road	38	88	-	3	58	18	-	53	**43**	-	30	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	8	-	-	-	-	-	28	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	-	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School	-	-	-	3	-	-	-	-	-	-	28	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	-	-	-	-	-	-	35	-	5
35	Taylor Road & Rippey Road	5	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	18	-	-	-	-	-	-	-	73	-	75	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	0.95%	0.82%	1.23%	0.00%	0.99%	0.00%	0.00%	0.00%	0.89%	0.74%	0.00%	0.00%
2	0.00%	2.11%	0.00%	0.00%	2.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	2.94%	-	0.00%	-	-	-	-	0.85%	4.17%	0.00%	1.05%	-
6	4.55%	2.46%	4.35%	0.00%	1.16%	0.00%	0.00%	0.00%	7.95%	3.29%	0.00%	0.00%
7	-	3.64%	0.00%	0.00%	2.71%	0.00%	-	-	0.00%	0.00%	-	2.15%
8	0.00%	19.90%	0.00%	0.00%	12.86%	3.49%	4.05%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	8.15%	0.00%	-	10.23%	0.00%	0.00%	-	0.00%	0.00%	0.00%	21.53%
10	-	1.30%	0.00%	0.00%	0.99%	26.52%	13.07%	0.00%	0.00%	0.00%	-	0.00%
11	-	1.41%	0.00%	-	0.81%	-	-	-	-	-	-	0.00%
12	-	1.38%	0.00%	0.00%	0.84%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%
13	0.00%	1.44%	-	-	0.95%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	1.22%	0.00%	1.12%	1.19%	1.37%	2.27%	0.00%	0.00%	0.00%	0.00%	0.71%
15	0.00%	2.01%	0.00%	0.00%	2.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	0.93%	0.38%	0.00%	0.97%	25.00%	14.81%	0.00%	0.00%	0.52%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	3.23%	2.22%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	-	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	3.85%	-	-	-	0.00%	0.00%	0.00%	9.09%	0.00%	-
21	0.00%	3.32%	-	-	2.15%	0.00%	-	-	-	-	-	-
22	0.00%	1.97%	-	-	1.28%	0.00%	0.00%	-	0.00%	-	-	-
23	0.00%	0.00%	5.56%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	7.69%	0.25%	0.00%
24	-	-6.55%	100.00%	100.00%	-3.57%	-	-	-	-	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.00%	-	-	1.02%	-
26	1.41%	-	2.17%	0.00%	-	0.00%	-	0.00%	0.61%	0.69%	0.00%	-
27	-	2.01%	25.00%	0.00%	0.77%	-	-	-	-	50.00%	-	0.00%
28	0.00%	2.01%	3.85%	0.00%	0.75%	0.00%	0.00%	0.00%	0.00%	2.94%	0.00%	0.00%
29	1.23%	0.64%	0.00%	0.00%	0.36%	0.00%	0.00%	0.00%	0.56%	0.00%	0.00%	0.00%
30	0.00%	0.74%	-	-	0.34%	-	-	-	0.00%	-	-	-
31	-	1.14%	0.92%	0.00%	0.57%	-	-	-	-	1.27%	-	0.00%
32	-	1.27%	0.00%	0.00%	0.60%	-	-	-	-	0.00%	-	0.00%
33	0.00%	1.21%	0.00%	0.00%	0.81%	0.00%	-	-	0.00%	0.00%	-	0.00%
34	-	0.94%	0.00%	0.00%	0.75%	-	-	-	-	0.00%	-	0.00%
35	1.79%	0.33%	-	-	0.45%	-	0.00%	-	2.63%	-	-	-
36	0.78%	0.88%	0.00%	0.00%	1.00%	0.00%	-	-	0.54%	0.00%	0.00%	0.00%
37	100.00%	-	100.00%	-	-	-	-	0.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

ExistingP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	2.07%	2.99%	2.67%	0.00%	3.68%	0.00%	0.00%	0.00%	1.72%	3.45%	0.00%	0.00%
2	0.00%	5.23%	0.00%	0.00%	5.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	4.65%	-	0.00%	-	-	-	-	3.28%	6.45%	0.00%	3.05%	-
6	15.33%	2.91%	9.09%	0.00%	4.22%	0.00%	0.00%	0.00%	11.90%	8.28%	0.00%	0.00%
7	-	6.32%	0.00%	6.60%	6.98%	-	-	-	0.00%	0.00%	-	2.75%
8	0.00%	24.93%	0.00%	0.00%	25.53%	10.11%	5.11%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	12.72%	0.00%	-	20.48%	0.00%	0.00%	-	0.00%	0.00%	0.00%	43.68%
10	-	2.20%	0.00%	0.00%	3.75%	31.63%	21.10%	0.00%	0.00%	0.00%	-	0.00%
11	-	2.21%	0.00%	-	3.11%	-	-	-	-	-	-	0.00%
12	0.00%	2.13%	0.00%	0.00%	3.19%	0.00%	0.00%	-	0.00%	0.00%	-	0.00%
13	0.00%	2.39%	-	-	3.32%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	2.06%	0.00%	2.72%	2.95%	3.59%	2.61%	0.00%	0.00%	0.00%	0.00%	2.99%
15	0.00%	3.49%	0.00%	0.00%	4.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	1.66%	1.15%	0.00%	1.80%	33.33%	28.57%	0.00%	0.00%	0.92%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	3.98%	4.92%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	9.52%	-	-	-	0.00%	0.00%	0.00%	9.09%	0.00%	-
21	0.00%	5.65%	-	-	5.31%	0.00%	-	-	0.00%	-	-	-
22	0.00%	2.58%	-	-	3.44%	0.00%	0.00%	-	0.00%	-	-	-
23	0.00%	0.00%	14.81%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	18.18%	0.33%	0.00%
24	-	-9.82%	100.00%	100.00%	-9.22%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	1.36%	-
26	1.61%	-	3.01%	-	-	-	0.00%	0.00%	3.17%	4.94%	0.00%	-
27	-	1.92%	28.57%	0.00%	3.47%	-	-	-	-	40.00%	-	0.00%
28	0.00%	2.16%	2.82%	0.00%	3.89%	0.00%	0.00%	0.00%	0.00%	6.06%	0.00%	0.00%
29	1.98%	1.89%	0.00%	0.00%	3.10%	0.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%
30	0.00%	1.46%	-	-	2.16%	0.00%	-	-	0.00%	-	-	-
31	-	2.44%	6.25%	0.00%	3.85%	-	-	-	-	4.65%	-	0.00%
32	-	2.79%	0.00%	0.00%	3.06%	-	-	-	-	0.00%	-	0.00%
33	-	2.80%	0.00%	0.00%	2.63%	-	-	-	-	0.00%	-	0.00%
34	-	2.78%	0.00%	0.00%	2.63%	-	-	-	-	0.00%	-	0.00%
35	8.00%	1.91%	-	-	2.16%	0.00%	0.00%	-	6.45%	-	-	-
36	1.96%	2.74%	0.00%	0.00%	2.71%	0.00%	-	-	3.36%	0.00%	0.00%	0.00%
37	100.00%	-	100.00%	-	-	-	-	1.38%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

ExistingP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	5.82%	8.44%	6.50%	0.00%	8.58%	0.00%	0.00%	0.00%	6.38%	5.13%	0.00%	0.00%
2	0.00%	14.15%	0.00%	0.00%	12.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	4.00%	0.00%	0.00%	0.00%	-	0.00%	-	20.00%	3.48%	0.00%	21.05%	-
6	24.07%	10.89%	17.69%	0.00%	10.37%	0.00%	0.00%	0.00%	25.47%	17.78%	0.00%	0.00%
7	-	16.74%	0.00%	16.48%	15.92%	-	-	-	0.00%	0.00%	-	9.84%
8	0.00%	44.57%	0.00%	0.00%	37.84%	14.66%	13.33%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	24.08%	0.00%	-	30.05%	0.00%	0.00%	-	0.00%	0.00%	0.00%	56.22%
10	-	7.95%	0.00%	0.00%	10.18%	48.59%	24.19%	0.00%	0.00%	0.00%	-	0.00%
11	-	8.10%	0.00%	-	7.92%	-	-	-	-	-	-	0.00%
12	0.00%	7.57%	0.00%	0.00%	8.36%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%
13	0.00%	7.20%	-	-	7.82%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	6.85%	0.00%	6.36%	7.76%	10.89%	8.76%	0.00%	0.00%	0.00%	0.00%	6.67%
15	0.00%	11.45%	0.00%	0.00%	8.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	4.51%	3.65%	0.00%	5.00%	50.00%	47.73%	0.00%	0.00%	2.98%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	8.76%	9.42%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	20.00%	-	-	-	0.00%	0.00%	0.00%	25.00%	0.00%	-
21	0.00%	14.85%	-	-	12.69%	-	-	-	-	-	-	-
22	0.00%	4.66%	-	-	5.56%	0.00%	0.00%	-	0.00%	-	-	-
23	0.00%	0.00%	34.78%	0.00%	0.00%	0.00%	0.00%	0.80%	0.00%	26.92%	0.75%	0.00%
24	-	-20.64%	100.00%	100.00%	-15.81%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	3.45%	-
26	6.36%	0.00%	7.41%	0.00%	0.00%	0.00%	0.00%	0.00%	7.80%	2.67%	0.00%	0.00%
27	-	6.56%	80.00%	0.00%	7.99%	-	-	-	-	40.00%	-	0.00%
28	0.00%	7.34%	13.33%	0.00%	8.37%	0.00%	0.00%	0.00%	0.00%	8.51%	0.00%	0.00%
29	4.21%	6.02%	0.00%	0.00%	6.25%	0.00%	0.00%	0.00%	3.39%	0.00%	0.00%	0.00%
30	0.00%	3.94%	-	-	4.41%	0.00%	0.00%	-	0.00%	-	-	-
31	-	6.21%	12.90%	0.00%	7.55%	-	-	-	-	10.26%	-	0.00%
32	-	6.25%	0.00%	-	6.12%	-	-	-	-	0.00%	-	0.00%
33	0.00%	6.52%	0.00%	0.00%	6.52%	-	-	-	0.00%	0.00%	-	0.00%
34	-	6.00%	0.00%	0.00%	5.80%	-	-	-	-	0.00%	-	0.00%
35	12.12%	5.14%	-	-	5.93%	0.00%	-	-	19.05%	-	-	-
36	7.21%	7.90%	0.00%	0.00%	7.08%	0.00%	-	-	5.37%	0.00%	0.00%	0.00%
37	100.00%	-	100.00%	-	-	-	-	3.49%	100.00%	100.00%	0.00%	-

Queues
1: Taylor Rd & King Rd

07/01/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	197	136	259	156	297	243	418	93	46	478
v/c Ratio	0.64	0.45	0.56	0.41	0.75	0.68	0.62	0.16	0.33	0.70
Control Delay	49.7	43.6	10.1	38.7	46.3	48.7	33.3	6.6	55.3	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	43.6	10.1	38.7	46.3	48.7	33.3	6.6	55.3	40.8
Queue Length 50th (ft)	113	75	0	82	152	137	216	0	27	133
Queue Length 95th (ft)	213	152	62	168	295	267	384	34	73	220
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	550	542	632	545	552	487	843	726	516	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.25	0.41	0.29	0.54	0.50	0.50	0.13	0.09	0.32

Intersection Summary

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	62	527	2	357	59	460	374
v/c Ratio	0.23	0.21	0.59	0.01	0.60	0.11	0.75	0.27
Control Delay	19.7	22.2	6.3	25.0	19.3	4.4	29.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	22.2	6.3	25.0	19.3	4.4	29.0	4.8
Queue Length 50th (ft)	14	16	23	1	91	0	124	32
Queue Length 95th (ft)	48	50	99	7	173	18	#349	122
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	759	775	893	641	1439	1187	616	1423
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.59	0.00	0.25	0.05	0.75	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	99	133	55	86	182	631	20	241	398
v/c Ratio	0.73	0.20	0.32	0.47	0.67	0.45	0.17	0.53	0.64
Control Delay	67.7	6.8	48.4	44.8	51.8	20.4	50.7	33.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	6.8	48.4	44.8	51.8	20.4	50.7	33.5	11.7
Queue Length 50th (ft)	50	0	30	37	99	120	11	116	34
Queue Length 95th (ft)	#194	48	81	100	207	212	41	211	132
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	135	651	532	527	426	1747	434	871	906
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.20	0.10	0.16	0.43	0.36	0.05	0.28	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	66	183	94	227	190	22	164	303	171	30	640	117
v/c Ratio	0.42	0.58	0.24	0.55	0.48	0.05	0.65	0.35	0.16	0.24	0.98	0.18
Control Delay	54.6	47.5	1.4	48.8	40.9	0.2	54.2	21.4	2.0	53.3	67.3	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	47.5	1.4	48.8	40.9	0.2	54.2	21.4	2.0	53.3	67.3	2.0
Queue Length 50th (ft)	40	109	0	71	109	0	100	129	0	18	401	0
Queue Length 95th (ft)	96	202	0	127	203	0	190	251	29	55	#842	16
Internal Link Dist (ft)		429			1915			582			10000	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	339	536	559	855	608	609	409	854	1239	346	650	666
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.34	0.17	0.27	0.31	0.04	0.40	0.35	0.14	0.09	0.98	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	111	99	555	53	135	827
v/c Ratio	0.34	0.43	0.21	0.37	0.05	0.61	0.38
Control Delay	3.0	27.0	3.5	14.8	0.7	34.4	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	27.0	3.5	14.8	0.7	34.4	7.8
Queue Length 50th (ft)	0	32	0	74	0	40	76
Queue Length 95th (ft)	3	75	19	116	5	#91	112
Internal Link Dist (ft)				219			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	323	284	597	1591	1052	297	2236
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.39	0.17	0.35	0.05	0.45	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	77	24	114	155	43	29	234	613	118	93	940	90
v/c Ratio	0.44	0.19	0.40	0.59	0.21	0.11	0.66	0.38	0.15	0.48	0.70	0.14
Control Delay	55.8	55.5	14.8	52.6	48.5	0.9	49.1	18.6	3.7	55.1	30.7	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	55.5	14.8	52.6	48.5	0.9	49.1	18.6	3.7	55.1	30.7	7.1
Queue Length 50th (ft)	47	15	0	94	25	0	139	126	0	57	259	3
Queue Length 95th (ft)	114	49	33	194	70	0	269	217	33	131	434	40
Internal Link Dist (ft)		707			401			403			598	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	503	535	831	503	530	525	784	2575	1221	339	1794	839
Starvation Cap Reductn	0	0	0	0	0	0	0	457	0	0	16	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.14	0.31	0.08	0.06	0.30	0.29	0.10	0.27	0.53	0.11

Intersection Summary

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	70	669	200	186	84	742	159	1246	42
v/c Ratio	0.04	0.30	0.77	0.50	0.39	0.48	0.25	0.17	0.60	0.05
Control Delay	36.8	9.2	32.1	22.2	7.4	41.7	7.4	1.9	18.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.8	9.2	32.1	22.2	7.4	41.7	7.4	1.9	18.0	1.3
Queue Length 50th (ft)	2	0	136	50	0	35	50	0	147	0
Queue Length 95th (ft)	14	21	220	144	55	87	89	24	248	7
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	494	671	2773	775	784	713	4599	1352	2221	815
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.10	0.24	0.26	0.24	0.12	0.16	0.12	0.56	0.05

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	405	108	210	45	108	882	23	198	1162	264
v/c Ratio	0.42	0.17	0.47	0.18	0.32	0.57	0.05	0.37	0.65	0.30
Control Delay	16.5	22.8	8.6	25.2	9.1	18.7	0.2	23.3	11.8	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	22.8	8.6	25.2	9.1	18.7	0.2	23.3	11.8	2.3
Queue Length 50th (ft)	48	16	0	12	1	68	0	28	128	0
Queue Length 95th (ft)	93	40	48	42	36	111	0	61	211	27
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	3022	2457	1120	1397	845	4994	1338	1719	3539	1482
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.04	0.19	0.03	0.13	0.18	0.02	0.12	0.33	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	1	45	1	5	904	28	44	1494	4
v/c Ratio	0.03	0.00	0.15	0.01	0.03	0.30	0.03	0.26	0.55	0.00
Control Delay	33.0	0.0	31.8	32.0	0.2	9.9	0.0	32.8	5.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	0.0	31.8	32.0	0.2	9.9	0.0	32.8	5.9	0.0
Queue Length 50th (ft)	1	0	9	0	0	70	0	17	109	0
Queue Length 95th (ft)	9	0	24	5	0	127	0	46	238	0
Internal Link Dist (ft)		226		372		197			363	
Turn Bay Length (ft)	190		285		185		45	245		340
Base Capacity (vph)	515	1085	1259	1084	773	4188	1280	1128	3471	1189
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.04	0.00	0.01	0.22	0.02	0.04	0.43	0.00

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	29	11	96	912	1784
v/c Ratio	0.11	0.08	0.42	0.30	0.56
Control Delay	39.6	22.5	40.9	1.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	22.5	40.9	1.8	8.6
Queue Length 50th (ft)	7	0	47	47	176
Queue Length 95th (ft)	19	13	85	53	185
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	70	90	215		
Base Capacity (vph)	1708	832	924	3438	3701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.10	0.27	0.48

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	106	246	243	117	479	461	789	107	711	176
v/c Ratio	0.49	0.33	0.47	0.50	0.63	0.60	0.69	0.51	0.57	0.37
Control Delay	56.4	39.3	8.5	55.4	39.3	43.2	35.4	56.6	38.5	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	39.3	8.5	55.4	39.3	43.2	35.4	56.6	38.5	14.7
Queue Length 50th (ft)	67	73	0	74	135	144	237	68	153	26
Queue Length 95th (ft)	142	130	50	153	222	234	363	142	231	84
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	496	1718	862	788	2126	1346	1777	469	2179	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.14	0.28	0.15	0.23	0.34	0.44	0.23	0.33	0.24

Intersection Summary

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	56	78	96	34	101	452	33	369	44
v/c Ratio	0.26	0.26	0.32	0.10	0.32	0.42	0.17	0.41	0.06
Control Delay	25.9	9.4	25.7	4.6	25.4	11.0	27.1	15.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	9.4	25.7	4.6	25.4	11.0	27.1	15.3	4.2
Queue Length 50th (ft)	15	0	27	0	28	58	9	91	0
Queue Length 95th (ft)	54	33	79	13	82	222	38	194	16
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	696	790	945	919	979	1502	793	1573	1278
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.10	0.04	0.10	0.30	0.04	0.23	0.03

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	30	197	280	290	94	50	480	590	156	475
v/c Ratio	0.21	0.52	0.67	0.68	0.21	0.34	0.43	0.81	0.59	0.33
Control Delay	64.3	40.8	51.7	52.0	10.3	68.1	33.0	26.6	62.3	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	40.8	51.7	52.0	10.3	68.1	33.0	26.6	62.3	24.8
Queue Length 50th (ft)	21	44	195	204	2	36	144	192	109	125
Queue Length 95th (ft)	69	112	397	410	50	102	263	464	244	225
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	405	928	936	956	917	332	1915	1015	569	2308
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.21	0.30	0.30	0.10	0.15	0.25	0.58	0.27	0.21

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	155	876	20	694	603	14	25	153	155	107
v/c Ratio	0.74	0.60	0.21	0.68	0.84	0.03	0.05	0.65	0.65	0.34
Control Delay	76.5	32.5	65.9	43.0	25.5	38.4	30.6	64.5	64.3	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.5	32.5	65.9	43.0	25.5	38.4	30.6	64.5	64.3	10.6
Queue Length 50th (ft)	121	265	16	260	171	8	11	123	125	0
Queue Length 95th (ft)	#245	417	45	341	330	28	36	205	207	43
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	221	1471	282	1432	846	511	459	449	455	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.60	0.07	0.48	0.71	0.03	0.05	0.34	0.34	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	734	482	396	1128	51	237
v/c Ratio	0.51	0.53	0.81	0.43	0.20	0.76
Control Delay	23.7	5.1	42.7	5.4	31.4	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	5.1	42.7	5.4	31.4	35.6
Queue Length 50th (ft)	153	0	200	96	25	73
Queue Length 95th (ft)	#289	75	270	182	50	135
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1446	904	546	2614	523	536
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.53	0.73	0.43	0.10	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	196	580	874	567	535	519
v/c Ratio	0.76	0.31	0.74	0.91	0.77	0.72
Control Delay	53.8	12.4	30.4	47.2	22.7	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	12.4	30.4	47.2	22.7	18.4
Queue Length 50th (ft)	102	90	224	300	167	130
Queue Length 95th (ft)	#177	124	301	#508	#317	260
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	303	1861	1187	633	701	728
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.31	0.74	0.90	0.76	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	56	1519	13	743	161	30
v/c Ratio	0.26	0.66	0.09	0.37	0.51	0.10
Control Delay	32.8	10.4	33.6	10.5	31.9	3.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	32.8	10.5	33.6	10.5	31.9	3.7
Queue Length 50th (ft)	19	147	4	92	53	0
Queue Length 95th (ft)	63	386	24	158	136	8
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	685	2681	571	2687	665	564
Starvation Cap Reductn	0	254	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.63	0.02	0.28	0.24	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	570	797	14	581	164	34	17	68
v/c Ratio	0.97	0.38	0.08	0.64	0.54	0.11	0.17	0.33
Control Delay	65.0	15.3	41.2	33.3	43.2	20.4	50.3	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.0	15.3	41.2	33.3	43.2	20.4	50.3	8.7
Queue Length 50th (ft)	328	104	8	149	90	7	10	0
Queue Length 95th (ft)	#765	347	27	253	167	34	36	23
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	588	2342	588	2273	588	577	466	591
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.34	0.02	0.26	0.28	0.06	0.04	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	59	580	168	59	1005
v/c Ratio	0.29	0.19	0.20	0.12	0.29	0.44
Control Delay	17.7	7.2	7.0	0.8	22.4	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	7.2	7.0	0.8	22.4	5.2
Queue Length 50th (ft)	19	0	17	0	14	54
Queue Length 95th (ft)	38	21	58	10	41	101
Internal Link Dist (ft)	551		598			344
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1308	639	2838	1513	206	2281
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.09	0.20	0.11	0.29	0.44

Intersection Summary

Queues
1: Taylor Rd & King Rd

07/01/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	133	392	130	166	326	376	169	54	397
v/c Ratio	0.27	0.52	0.71	0.50	0.62	0.63	0.48	0.23	0.34	0.66
Control Delay	36.3	41.7	11.7	40.8	41.4	33.9	22.7	4.5	44.5	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	41.7	11.7	40.8	41.4	33.9	22.7	4.5	44.5	36.0
Queue Length 50th (ft)	30	63	0	61	71	139	138	0	26	92
Queue Length 95th (ft)	75	134	81	130	152	#329	290	42	71	161
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	601	639	795	607	609	521	922	823	563	1679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.21	0.49	0.21	0.27	0.63	0.41	0.21	0.10	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	58	91	479	23	488	85	413	522
v/c Ratio	0.20	0.36	0.59	0.13	0.73	0.14	0.78	0.38
Control Delay	20.2	28.7	9.6	30.7	23.6	4.7	37.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	28.7	9.6	30.7	23.6	4.7	37.0	6.6
Queue Length 50th (ft)	12	28	44	8	145	2	132	57
Queue Length 95th (ft)	47	79	161	32	265	25	#396	219
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	643	559	811	542	1233	1022	532	1356
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.16	0.59	0.04	0.40	0.08	0.78	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	115	81	112	101	112	606	49	203	354
v/c Ratio	0.73	0.12	0.52	0.39	0.54	0.60	0.32	0.48	0.57
Control Delay	59.4	7.3	47.5	23.9	48.1	27.0	47.2	32.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	7.3	47.5	23.9	48.1	27.0	47.2	32.5	7.9
Queue Length 50th (ft)	52	0	56	20	56	139	25	92	7
Queue Length 95th (ft)	#203	37	131	77	131	217	72	177	78
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	157	661	563	576	437	1731	454	929	965
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.12	0.20	0.18	0.26	0.35	0.11	0.22	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	298	189	326	307	49	154	772	297	26	506	108
v/c Ratio	0.60	0.73	0.38	0.65	0.66	0.10	0.65	0.96	0.28	0.24	0.87	0.18
Control Delay	61.6	53.6	7.9	53.5	46.7	0.4	61.3	58.1	3.7	60.6	55.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	53.6	7.9	53.5	46.7	0.4	61.3	58.1	3.7	60.6	55.7	1.4
Queue Length 50th (ft)	90	201	0	119	200	0	109	~639	19	19	356	0
Queue Length 95th (ft)	166	338	58	181	334	0	193	#1004	62	52	#677	6
Internal Link Dist (ft)		429			1915			582			10000	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	319	495	562	760	583	560	384	805	1169	296	583	595
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.60	0.34	0.43	0.53	0.09	0.40	0.96	0.25	0.09	0.87	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	117	114	1022	121	110	835
v/c Ratio	0.48	0.49	0.24	0.55	0.10	0.62	0.36
Control Delay	7.9	32.4	5.5	14.7	1.3	43.9	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	32.4	5.5	14.7	1.3	43.9	6.9
Queue Length 50th (ft)	0	41	0	155	0	39	77
Queue Length 95th (ft)	27	#93	30	217	14	#102	111
Internal Link Dist (ft)				216			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	308	259	566	1868	1167	209	2341
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.45	0.20	0.55	0.10	0.53	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	187	28	306	114	26	35	232	1216	73	65	1254	95
v/c Ratio	0.61	0.16	0.56	0.56	0.22	0.19	0.73	0.60	0.08	0.42	0.79	0.13
Control Delay	54.8	51.7	10.0	60.1	59.0	2.4	57.9	19.9	5.9	60.5	33.3	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.3	0.0
Total Delay	54.8	51.7	10.0	60.1	59.0	2.4	57.9	20.3	5.9	60.5	33.7	7.3
Queue Length 50th (ft)	129	19	0	79	18	0	159	306	5	45	400	5
Queue Length 95th (ft)	227	53	47	154	53	0	269	489	33	102	#691	44
Internal Link Dist (ft)		707			508			403			598	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	485	491	958	471	491	475	693	2379	1059	317	1586	752
Starvation Cap Reductn	0	0	0	0	0	0	0	570	0	0	60	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.06	0.32	0.24	0.05	0.07	0.33	0.67	0.07	0.21	0.82	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	82	120	485	248	233	289	1113	279	1564	100
v/c Ratio	0.54	0.23	0.50	0.78	0.59	0.80	0.36	0.26	0.88	0.16
Control Delay	61.2	3.7	30.9	50.8	19.4	56.7	11.5	2.1	39.3	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	3.7	30.9	50.8	19.4	56.7	11.5	2.1	39.3	10.9
Queue Length 50th (ft)	51	0	128	133	38	176	123	0	342	9
Queue Length 95th (ft)	117	21	195	256	132	314	215	39	#641	56
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	375	680	2106	609	637	558	3628	1218	1782	632
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.18	0.23	0.41	0.37	0.52	0.31	0.23	0.88	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	519	237	63	111	327	1386	93	295	842	536
v/c Ratio	0.52	0.55	0.25	0.51	0.76	0.74	0.17	0.36	0.41	0.46
Control Delay	27.9	41.7	11.6	46.5	37.1	29.2	7.4	29.0	10.0	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	41.7	11.6	46.5	37.1	29.2	7.4	29.0	10.0	2.2
Queue Length 50th (ft)	114	60	0	54	119	184	2	62	107	0
Queue Length 95th (ft)	198	120	34	126	#293	275	38	125	187	40
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	2196	1616	747	914	559	3619	967	1109	3091	1473
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.15	0.08	0.12	0.58	0.38	0.10	0.27	0.27	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	1	82	12	2	1479	61	28	1022	1
v/c Ratio	0.03	0.00	0.24	0.02	0.01	0.44	0.06	0.18	0.40	0.00
Control Delay	37.2	0.0	34.5	0.0	37.5	8.1	1.8	36.7	6.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	0.0	34.5	0.0	37.5	8.1	1.8	36.7	6.4	0.0
Queue Length 50th (ft)	2	0	15	0	1	63	0	11	62	0
Queue Length 95th (ft)	15	0	46	0	8	250	13	43	240	0
Internal Link Dist (ft)		226				199			363	
Turn Bay Length (ft)	190		285	185	90		45	245		340
Base Capacity (vph)	741	1046	1343	1170	741	4175	1314	1323	3529	1562
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.00	0.06	0.01	0.00	0.35	0.05	0.02	0.29	0.00

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	125	78	27	1275	1022
v/c Ratio	0.23	0.25	0.12	0.56	0.37
Control Delay	20.2	8.5	21.7	6.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	8.5	21.7	6.3	8.1
Queue Length 50th (ft)	14	0	6	86	38
Queue Length 95th (ft)	39	30	27	142	115
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	70	90	215		
Base Capacity (vph)	2790	1302	1437	3539	5034
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.04	0.06	0.02	0.36	0.20

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	247	324	369	55	382	330	1036	158	729	180
v/c Ratio	0.63	0.28	0.48	0.36	0.63	0.56	1.02	0.60	0.54	0.37
Control Delay	49.4	30.5	5.6	59.8	41.4	48.0	74.7	56.9	38.8	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	30.5	5.6	59.8	41.4	48.0	74.7	56.9	38.8	15.1
Queue Length 50th (ft)	156	90	0	37	109	111	~433	106	166	30
Queue Length 95th (ft)	297	156	74	91	189	188	#684	205	251	105
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	487	1593	912	738	1935	1248	1758	483	2081	696
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.20	0.40	0.07	0.20	0.26	0.59	0.33	0.35	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	92	131	113	35	49	700	22	512	13
v/c Ratio	0.37	0.33	0.46	0.11	0.24	0.65	0.11	0.52	0.02
Control Delay	29.9	8.1	32.5	4.5	32.5	14.7	33.2	14.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	8.1	32.5	4.5	32.5	14.7	33.2	14.5	0.1
Queue Length 50th (ft)	29	0	36	0	16	124	7	139	0
Queue Length 95th (ft)	85	44	102	13	57	422	33	288	0
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	633	818	619	742	764	1449	864	1457	1088
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.16	0.18	0.05	0.06	0.48	0.03	0.35	0.01

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	113	409	412	221	46	641	553	105	686
v/c Ratio	0.28	0.42	0.75	0.75	0.36	0.36	0.53	0.80	0.54	0.48
Control Delay	73.9	63.6	51.9	51.6	14.6	76.8	37.9	34.0	74.3	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.9	63.6	51.9	51.6	14.6	76.8	37.9	34.0	74.3	32.7
Queue Length 50th (ft)	32	45	343	344	45	40	236	276	91	240
Queue Length 95th (ft)	83	94	560	562	129	97	370	533	183	372
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	388	766	814	824	842	288	1682	871	505	2101
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.50	0.50	0.26	0.16	0.38	0.63	0.21	0.33

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	191	696	38	888	434	51	31	255	255	235
v/c Ratio	0.95	0.53	0.36	0.83	0.73	0.11	0.07	0.77	0.76	0.47
Control Delay	114.5	38.4	75.0	53.9	29.1	44.6	32.1	69.4	68.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.5	38.4	75.0	53.9	29.1	44.6	32.1	69.4	68.8	8.6
Queue Length 50th (ft)	181	270	35	399	179	37	14	240	238	0
Queue Length 95th (ft)	#363	369	76	513	333	79	45	347	346	72
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	200	1308	258	1284	669	454	460	423	426	574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.53	0.15	0.69	0.65	0.11	0.07	0.60	0.60	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	719	497	569	1126	45	315
v/c Ratio	0.69	0.62	0.90	0.46	0.13	0.82
Control Delay	35.7	6.8	47.9	7.4	29.1	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	6.8	47.9	7.4	29.1	41.8
Queue Length 50th (ft)	206	0	298	129	22	125
Queue Length 95th (ft)	#327	89	#531	228	46	200
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1046	807	645	2464	503	512
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.62	0.88	0.46	0.09	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	220	570	1308	386	377	354
v/c Ratio	0.82	0.27	0.89	0.77	0.74	0.55
Control Delay	63.7	10.1	37.1	40.1	32.0	9.6
Queue Delay	0.0	0.0	1.2	0.0	0.0	0.0
Total Delay	63.7	10.1	38.3	40.1	32.0	9.6
Queue Length 50th (ft)	126	82	402	214	175	37
Queue Length 95th (ft)	#243	123	#584	311	278	113
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	286	2147	1462	586	586	713
Starvation Cap Reductn	0	0	46	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.27	0.92	0.66	0.64	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	57	1130	24	1227	95	23
v/c Ratio	0.23	0.47	0.11	0.54	0.33	0.08
Control Delay	30.4	8.2	31.3	11.1	29.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	8.2	31.3	11.1	29.8	1.8
Queue Length 50th (ft)	19	77	8	170	31	0
Queue Length 95th (ft)	61	234	34	286	87	4
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	827	2828	827	2888	796	736
Starvation Cap Reductn	0	314	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.45	0.03	0.42	0.12	0.03

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	195	794	24	701	126	32	85	379
v/c Ratio	0.59	0.49	0.11	0.63	0.45	0.11	0.46	0.70
Control Delay	45.7	22.3	42.3	31.1	43.9	16.8	50.9	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	22.3	42.3	31.1	43.9	16.8	50.9	12.5
Queue Length 50th (ft)	96	115	12	163	63	1	42	0
Queue Length 95th (ft)	244	389	46	353	159	31	127	99
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	629	2454	629	2495	629	590	484	806
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.32	0.04	0.28	0.20	0.05	0.18	0.47

Intersection Summary

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	437	175	1029	421	154	1014
v/c Ratio	0.52	0.34	0.51	0.34	0.53	0.48
Control Delay	20.5	5.2	16.2	1.7	29.2	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	5.2	16.2	1.7	29.2	7.9
Queue Length 50th (ft)	64	0	102	7	47	87
Queue Length 95th (ft)	100	37	159	30	101	153
Internal Link Dist (ft)	597		598			348
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1114	631	2000	1310	335	2105
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.28	0.51	0.32	0.46	0.48

Intersection Summary

Queues
1: Taylor Rd & King Rd

07/01/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	54	232	193	108	233	278	152	27	332
v/c Ratio	0.31	0.27	0.60	0.57	0.32	0.57	0.35	0.21	0.17	0.53
Control Delay	35.6	34.8	12.4	34.0	26.6	30.3	17.1	4.3	36.4	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	34.8	12.4	34.0	26.6	30.3	17.1	4.3	36.4	29.4
Queue Length 50th (ft)	23	20	0	70	33	82	62	0	10	61
Queue Length 95th (ft)	63	56	45	145	82	162	159	28	36	114
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	728	727	798	779	760	689	1160	978	716	2146
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.29	0.25	0.14	0.34	0.24	0.16	0.04	0.15

Intersection Summary

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	116	295	17	369	98	356	461
v/c Ratio	0.13	0.43	0.33	0.09	0.64	0.18	0.63	0.36
Control Delay	17.8	26.7	2.4	27.3	22.1	4.7	26.4	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	26.7	2.4	27.3	22.1	4.7	26.4	7.0
Queue Length 50th (ft)	8	33	0	5	101	0	97	49
Queue Length 95th (ft)	29	83	30	23	187	25	#269	182
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	667	574	891	579	1338	1098	568	1325
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.20	0.33	0.03	0.28	0.09	0.63	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	112	65	72	106	154	458	34	151	353
v/c Ratio	0.65	0.10	0.39	0.50	0.61	0.45	0.25	0.46	0.61
Control Delay	47.3	7.1	42.9	36.8	44.8	23.6	44.1	34.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	7.1	42.9	36.8	44.8	23.6	44.1	34.2	8.4
Queue Length 50th (ft)	39	0	31	34	67	93	15	65	0
Queue Length 95th (ft)	#175	30	87	99	156	150	52	134	65
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	171	635	564	578	460	1788	452	942	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.10	0.13	0.18	0.33	0.26	0.08	0.16	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	207	171	287	179	26	172	371	277	31	400	63
v/c Ratio	0.42	0.56	0.39	0.58	0.36	0.05	0.63	0.47	0.25	0.23	0.74	0.11
Control Delay	55.7	45.4	8.8	47.7	36.2	0.2	53.4	26.1	1.9	55.2	43.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	45.4	8.8	47.7	36.2	0.2	53.4	26.1	1.9	55.2	43.9	0.4
Queue Length 50th (ft)	46	123	0	91	99	0	106	178	0	19	227	0
Queue Length 95th (ft)	110	234	59	163	191	0	210	344	37	59	#470	0
Internal Link Dist (ft)		429			1915			582			10000	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	366	590	609	906	685	662	445	825	1254	377	681	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.35	0.28	0.32	0.26	0.04	0.39	0.45	0.22	0.08	0.59	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	118	64	728	93	95	746
v/c Ratio	0.19	0.42	0.13	0.42	0.08	0.51	0.35
Control Delay	1.1	24.7	0.9	12.5	1.3	32.6	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	24.7	0.9	12.5	1.3	32.6	7.2
Queue Length 50th (ft)	0	33	0	92	0	27	64
Queue Length 95th (ft)	0	#76	3	140	11	#77	96
Internal Link Dist (ft)				217			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	373	289	627	1771	1214	216	2378
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.41	0.10	0.41	0.08	0.44	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	141	24	213	123	25	24	206	921	102	67	1041	121
v/c Ratio	0.51	0.16	0.51	0.55	0.21	0.12	0.67	0.47	0.11	0.41	0.66	0.16
Control Delay	50.1	51.6	11.5	54.5	54.5	1.3	52.6	16.4	4.6	55.4	26.2	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	50.1	51.6	11.5	54.5	54.5	1.3	52.6	16.5	4.6	55.4	26.3	8.5
Queue Length 50th (ft)	88	15	0	77	16	0	128	191	5	42	272	14
Queue Length 95th (ft)	171	46	41	154	48	0	230	310	35	98	446	58
Internal Link Dist (ft)		707			495			403			597	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	510	537	970	515	517	538	766	2602	1172	343	1735	815
Starvation Cap Reductn	0	0	0	0	0	0	0	575	0	0	19	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.04	0.22	0.24	0.05	0.04	0.27	0.45	0.09	0.20	0.61	0.15

Intersection Summary

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	424	292	265	354	766	255	1310	85
v/c Ratio	0.58	0.51	0.41	0.83	0.56	0.83	0.25	0.24	0.81	0.15
Control Delay	68.9	11.1	30.7	58.8	12.4	59.6	12.2	2.4	41.2	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.9	11.1	30.7	58.8	12.4	59.6	12.2	2.4	41.2	9.7
Queue Length 50th (ft)	60	45	124	196	20	242	91	0	328	3
Queue Length 95th (ft)	124	84	168	320	105	#464	160	42	#527	46
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	339	655	1917	552	627	508	3303	1108	1623	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.46	0.22	0.53	0.42	0.70	0.23	0.23	0.81	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	507	290	52	110	345	765	93	445	567	439
v/c Ratio	0.44	0.55	0.18	0.46	0.75	0.60	0.23	0.52	0.31	0.43
Control Delay	20.8	34.1	7.2	38.6	31.1	28.3	8.3	25.7	10.3	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	34.1	7.2	38.6	31.1	28.3	8.3	25.7	10.3	2.5
Queue Length 50th (ft)	86	61	0	45	104	86	0	82	65	0
Queue Length 95th (ft)	157	121	22	110	237	145	38	154	119	41
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	2547	1837	839	1071	646	4078	1109	1285	3335	1499
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.16	0.06	0.10	0.53	0.19	0.08	0.35	0.17	0.29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	3	72	1	19	1	803	79	32	691	5
v/c Ratio	0.01	0.01	0.14	0.00	0.06	0.00	0.27	0.08	0.13	0.30	0.00
Control Delay	23.3	0.0	21.1	22.0	0.4	24.0	9.2	4.1	22.1	7.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	0.0	21.1	22.0	0.4	24.0	9.2	4.1	22.1	7.5	0.0
Queue Length 50th (ft)	1	0	7	0	0	0	27	0	7	35	0
Queue Length 95th (ft)	8	0	30	4	0	5	122	24	34	152	0
Internal Link Dist (ft)		226		372			193			363	
Turn Bay Length (ft)	190		285		185	90		45	245		340
Base Capacity (vph)	1228	1442	2292	1625	1394	1228	4992	1571	1611	3539	1581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.00	0.03	0.00	0.01	0.00	0.16	0.05	0.02	0.20	0.00

Intersection Summary

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	40	22	16	891	807
v/c Ratio	0.08	0.08	0.06	0.32	0.22
Control Delay	17.6	9.9	18.1	3.4	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	9.9	18.1	3.4	4.8
Queue Length 50th (ft)	5	0	4	44	25
Queue Length 95th (ft)	14	14	16	73	79
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	70	90	215		
Base Capacity (vph)	3111	1479	1651	3539	5012
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.01	0.01	0.25	0.16

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	143	192	193	42	290	172	638	115	510	105
v/c Ratio	0.51	0.20	0.34	0.25	0.51	0.34	0.58	0.46	0.33	0.20
Control Delay	40.8	27.2	6.7	42.2	25.3	35.6	27.1	41.3	23.5	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	27.2	6.7	42.2	25.3	35.6	27.1	41.3	23.5	6.3
Queue Length 50th (ft)	69	44	0	21	47	41	141	56	72	0
Queue Length 95th (ft)	143	82	54	58	98	82	242	121	122	37
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	662	2206	1038	993	2639	1679	2405	662	2853	891
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.09	0.19	0.04	0.11	0.10	0.27	0.17	0.18	0.12

Intersection Summary

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	72	23	20	29	20	407	23	499	69
v/c Ratio	0.27	0.07	0.07	0.08	0.08	0.37	0.10	0.40	0.07
Control Delay	23.5	2.1	20.9	3.5	24.6	10.1	24.4	8.4	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	2.1	20.9	3.5	24.6	10.1	24.4	8.4	3.6
Queue Length 50th (ft)	14	0	4	0	4	46	5	60	2
Queue Length 95th (ft)	62	5	24	9	27	180	29	224	22
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	894	1019	1000	1046	1107	1656	986	1716	1432
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.02	0.02	0.03	0.02	0.25	0.02	0.29	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	74	232	232	107	15	496	350	86	469
v/c Ratio	0.25	0.20	0.56	0.56	0.23	0.10	0.51	0.61	0.38	0.32
Control Delay	42.7	31.5	34.3	34.2	7.4	44.2	27.6	18.0	41.7	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	31.5	34.3	34.2	7.4	44.2	27.6	18.0	41.7	18.6
Queue Length 50th (ft)	21	12	103	103	0	7	105	64	39	69
Queue Length 95th (ft)	69	42	228	228	42	32	201	194	107	168
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	659	1270	1310	1313	1241	471	2706	1256	793	3109
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.18	0.18	0.09	0.03	0.18	0.28	0.11	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	203	435	23	414	444	46	39	211	214	206
v/c Ratio	0.84	0.39	0.21	0.58	0.68	0.08	0.07	0.67	0.68	0.45
Control Delay	78.5	34.0	59.5	45.4	9.5	32.7	18.7	55.1	55.4	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	34.0	59.5	45.4	9.5	32.7	18.7	55.1	55.4	8.7
Queue Length 50th (ft)	148	138	17	146	0	24	8	153	155	0
Queue Length 95th (ft)	#333	212	48	216	96	62	40	253	257	63
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	242	1405	309	1567	911	554	532	521	523	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.31	0.07	0.26	0.49	0.08	0.07	0.40	0.41	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	491	434	397	743	31	181
v/c Ratio	0.28	0.44	0.83	0.25	0.24	0.64
Control Delay	16.2	3.6	46.5	2.2	43.6	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	3.6	46.5	2.2	43.6	17.1
Queue Length 50th (ft)	84	0	219	32	18	1
Queue Length 95th (ft)	154	61	294	67	43	61
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1742	987	605	2921	484	571
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.44	0.66	0.25	0.06	0.32

Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	162	388	759	326	318	296
v/c Ratio	0.70	0.17	0.47	0.72	0.72	0.48
Control Delay	54.5	8.2	19.7	39.5	36.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	8.2	19.7	39.5	36.3	5.6
Queue Length 50th (ft)	93	45	156	183	167	0
Queue Length 95th (ft)	156	81	249	253	243	55
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	286	2268	1624	586	561	711
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.17	0.47	0.56	0.57	0.42

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	64	691	17	643	99	22
v/c Ratio	0.21	0.31	0.07	0.34	0.29	0.06
Control Delay	20.5	6.4	21.1	10.5	20.3	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	6.4	21.1	10.5	20.3	1.9
Queue Length 50th (ft)	15	35	4	66	22	0
Queue Length 95th (ft)	47	118	20	122	64	5
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	1063	3374	1063	3420	1063	974
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.20	0.02	0.19	0.09	0.02

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	35	612	27	572	102	25	22	89
v/c Ratio	0.15	0.43	0.12	0.40	0.27	0.07	0.13	0.32
Control Delay	31.5	16.9	32.0	17.2	23.1	10.6	33.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	16.9	32.0	17.2	23.1	10.6	33.0	10.9
Queue Length 50th (ft)	9	60	7	57	25	0	6	0
Queue Length 95th (ft)	49	210	41	200	82	18	36	39
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	1007	3181	1007	3237	1007	861	781	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.19	0.03	0.18	0.10	0.03	0.03	0.09

Intersection Summary

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	542	249	611	574	240	736
v/c Ratio	0.59	0.41	0.38	0.51	0.77	0.36
Control Delay	21.0	5.0	16.6	5.0	42.5	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	5.0	16.6	5.0	42.5	7.6
Queue Length 50th (ft)	82	0	61	49	82	67
Queue Length 95th (ft)	124	43	91	100	#185	103
Internal Link Dist (ft)	574		597			347
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1075	667	1626	1178	323	2033
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.37	0.38	0.49	0.74	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option B

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative Long-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

ExistingP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	132	15	97	116	-	-	-	27	**#131**	-	31
8	Sierra College Boulevard & Granite Drive	**#245**	120	-	90	277	26	79	36	25	**#193**	53	-
21	Sierra College Boulevard & Driveway South of Brace Road	2	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	58	10	42	100	-	-	-	-	36	-	22
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	274	21	100	128	-	-	-	54	**#176**	-	37
8	Sierra College Boulevard & Granite Drive	**#257**	229	-	79	427	17	**#222**	44	42	**#163**	42	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	2	-	-	-
24	Sierra College Boulevard & Project Driveway	-	154	30	#117	153	-	-	-	-	92	-	38
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	156	16	76	90	-	-	-	-	**#151**	-	20
8	Sierra College Boulevard & Granite Drive	**#212**	164	-	72	290	37	#144	39	34	**#193**	39	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	112	75	158	102	-	-	-	-	134	-	51
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	4.01%	3.85%	0.00%	2.71%	0.00%	-	-	0.00%	1.89%	-	0.00%
8	0.00%	18.51%	8.13%	0.00%	11.88%	2.35%	2.74%	4.17%	0.00%	6.29%	2.38%	0.00%
21	0.00%	3.99%	-	-	2.34%	0.00%	-	-	-	-	-	-
24	-	0.00%	100.00%	100.00%	0.00%	-	-	-	-	100.00%	-	100.00%
25	-	-	-	-	-	-	-	1.12%	-	-	1.02%	-

Notes:

Shading indicates Project impact.

ExistingP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	6.61%	2.52%	6.60%	6.98%	-	-	-	0.00%	5.08%	-	0.00%
8	0.00%	22.98%	29.59%	0.00%	23.59%	8.05%	4.02%	7.14%	0.00%	21.90%	7.69%	0.00%
21	0.00%	6.17%	-	-	5.84%	0.00%	-	-	0.00%	-	-	-
24	-	0.00%	100.00%	100.00%	0.00%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	1.38%	100.00%	-	2.68%	-

Notes:

Shading indicates Project impact.

ExistingP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	17.45%	6.32%	16.48%	15.92%	-	-	-	0.00%	9.60%	-	0.00%
8	0.00%	40.61%	37.58%	0.00%	34.15%	11.61%	10.69%	14.81%	0.00%	32.18%	14.29%	0.00%
21	0.00%	16.13%	-	-	13.85%	-	-	-	-	-	-	-
24	-	-20.64%	100.00%	100.00%	-15.81%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	3.49%	100.00%	-	6.67%	-

Notes:

Shading indicates Project impact.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	113	97	557	55	135	827
v/c Ratio	0.36	0.61	0.21	0.45	0.06	0.53	0.43
Control Delay	7.0	44.8	6.1	15.9	2.9	30.7	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	44.8	6.1	15.9	2.9	30.7	7.9
Queue Length 50th (ft)	0	35	0	72	0	40	73
Queue Length 95th (ft)	27	#131	31	132	15	97	116
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	832	185	1078	2417	985	581	3408
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.61	0.09	0.23	0.06	0.23	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	76	25	114	166	44	29	234	730	93	929	89
v/c Ratio	0.40	0.15	0.34	0.71	0.24	0.11	0.73	0.32	0.44	0.70	0.14
Control Delay	40.1	35.9	10.5	52.7	37.0	0.9	47.0	13.9	39.5	23.7	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	35.9	10.5	52.7	37.0	0.9	47.0	13.9	39.5	23.7	4.2
Queue Length 50th (ft)	35	11	0	78	20	0	109	77	42	195	0
Queue Length 95th (ft)	79	36	25	#193	53	0	#245	120	90	277	26
Internal Link Dist (ft)		707			450			403		628	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	233	703	1057	233	697	671	320	2333	285	1575	753
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.04	0.11	0.71	0.06	0.04	0.73	0.31	0.33	0.59	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	63	580	157	61	1005
v/c Ratio	0.27	0.20	0.19	0.11	0.29	0.41
Control Delay	17.3	7.2	6.7	0.8	22.2	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	7.2	6.7	0.8	22.2	4.7
Queue Length 50th (ft)	18	0	17	0	14	53
Queue Length 95th (ft)	36	22	58	10	42	100
Internal Link Dist (ft)	551		628			307
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1360	665	3109	1543	214	2471
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.09	0.19	0.10	0.29	0.41

Intersection Summary

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	123	110	1025	124	110	835
v/c Ratio	0.49	0.86	0.25	0.65	0.12	0.55	0.40
Control Delay	13.4	85.0	7.1	17.2	2.0	41.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	85.0	7.1	17.2	2.0	41.2	7.6
Queue Length 50th (ft)	3	51	0	158	0	43	75
Queue Length 95th (ft)	54	#176	37	274	21	100	128
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	733	143	916	2005	1037	462	2947
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.86	0.12	0.51	0.12	0.24	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	185	30	306	146	28	35	232	1289	65	1222	93
v/c Ratio	0.69	0.21	0.61	0.66	0.20	0.14	0.78	0.47	0.41	0.80	0.12
Control Delay	53.5	42.9	10.6	54.1	42.7	1.2	55.7	14.7	47.5	27.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	53.5	42.9	10.6	54.1	42.7	1.2	55.7	14.8	47.5	27.7	2.1
Queue Length 50th (ft)	106	17	0	82	16	0	130	169	36	314	0
Queue Length 95th (ft)	#222	44	42	#163	42	0	#257	229	79	427	17
Internal Link Dist (ft)		707			523			403		648	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	269	597	1099	232	597	588	299	2718	189	1535	754
Starvation Cap Reductn	0	0	0	0	0	0	0	483	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.05	0.28	0.63	0.05	0.06	0.78	0.58	0.34	0.80	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	402	182	1029	387	161	1014
v/c Ratio	0.51	0.36	0.50	0.31	0.58	0.47
Control Delay	20.4	5.4	15.1	1.7	31.3	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	5.4	15.1	1.7	31.3	7.5
Queue Length 50th (ft)	58	0	96	9	48	80
Queue Length 95th (ft)	92	38	154	30	#117	153
Internal Link Dist (ft)	597		648			287
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1129	643	2067	1320	307	2135
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.28	0.50	0.29	0.52	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	130	57	734	99	95	746
v/c Ratio	0.22	0.72	0.15	0.47	0.09	0.45	0.35
Control Delay	1.5	55.1	5.8	13.4	1.9	30.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.5	55.1	5.8	13.4	1.9	30.9	6.1
Queue Length 50th (ft)	0	42	0	97	0	30	64
Queue Length 95th (ft)	0	#151	20	156	16	76	90
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	887	180	1023	2447	1112	559	3366
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.72	0.06	0.30	0.09	0.17	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	136	28	213	181	29	24	206	1023	67	982	117
v/c Ratio	0.40	0.17	0.48	0.71	0.17	0.10	0.71	0.43	0.37	0.73	0.18
Control Delay	36.6	36.8	9.5	50.0	35.9	0.8	47.6	14.7	39.9	24.6	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	36.8	9.5	50.0	35.9	0.8	47.6	14.7	39.9	24.6	4.5
Queue Length 50th (ft)	64	13	0	86	13	0	97	117	31	208	1
Queue Length 95th (ft)	#144	39	34	#193	39	0	#212	164	72	290	32
Internal Link Dist (ft)		707			486			403		658	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	336	704	1205	256	703	708	290	2417	216	1528	745
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.04	0.18	0.71	0.04	0.03	0.71	0.42	0.31	0.64	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	477	262	611	505	253	736
v/c Ratio	0.60	0.46	0.34	0.44	0.66	0.33
Control Delay	26.2	6.0	18.4	3.6	32.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	6.0	18.4	3.6	32.8	6.6
Queue Length 50th (ft)	90	0	69	24	98	68
Queue Length 95th (ft)	134	51	112	75	158	102
Internal Link Dist (ft)	574		658			277
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	946	626	1782	1200	514	2240
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.42	0.34	0.42	0.49	0.33

Intersection Summary

Project Driveway Option C

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1,900	600	465	2,500	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative Long-Term Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

ExistingP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	116	5	#91	112	-	-	-	3	75	-	19
8	Sierra College Boulevard & Granite Drive	**#245**	120	-	90	277	26	79	36	25	**#193**	53	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	56	10	40	92	-	-	-	-	36	-	22
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Project Driveway East & Brace Road	-	0	-	-	-	-	-	-	-	0	-	-

Notes:
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m - Volume for 95th percentile queue is metered by upstream signal.
Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	217	14	#102	111	-	-	-	27	#93	-	30
8	Sierra College Boulevard & Granite Drive	**#257**	229	-	79	427	17	**#222**	44	42	**#163**	42	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	3	-	-	-
24	Sierra College Boulevard & Project Driveway	-	159	25	101	153	-	-	-	-	92	-	37
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	-	-	-

Notes:
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m - Volume for 95th percentile queue is metered by upstream signal.
Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	140	11	#77	96	-	-	-	-	#76	-	3
8	Sierra College Boulevard & Granite Drive	**#212**	164	-	72	290	37	#144	39	34	**#193**	39	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	91	77	#185	103	-	-	-	-	109	-	43
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	0	-	-

Notes:
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m - Volume for 95th percentile queue is metered by upstream signal.
Bold indicated queues in excess of capacity. Shading indicates Project impact.

ExistingP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	3.64%	0.00%	0.00%	2.71%	0.00%	-	-	0.00%	0.00%	-	2.15%
8	0.00%	18.51%	8.13%	0.00%	11.88%	2.35%	2.74%	4.17%	0.00%	6.29%	2.38%	0.00%
21	0.00%	3.32%	-	-	2.15%	0.00%	-	-	-	-	-	-
24	-	-6.55%	100.00%	100.00%	-3.57%	-	-	-	-	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.00%	-	-	1.02%	-
37	100.00%	-	100.00%	-	-	-	-	0.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

ExistingP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	6.32%	0.00%	6.60%	6.98%	-	-	-	0.00%	0.00%	-	2.75%
8	0.00%	22.98%	29.59%	0.00%	23.59%	8.05%	4.02%	7.14%	0.00%	21.90%	7.69%	0.00%
21	0.00%	5.65%	-	-	5.31%	0.00%	-	-	0.00%	-	-	-
24	-	-9.82%	100.00%	100.00%	-9.22%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	1.36%	-
37	100.00%	-	100.00%	-	-	-	-	1.38%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

ExistingP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	16.74%	0.00%	16.48%	15.92%	-	-	-	0.00%	0.00%	-	9.84%
8	0.00%	40.61%	37.58%	0.00%	34.15%	11.61%	10.69%	14.81%	0.00%	32.18%	14.29%	0.00%
21	0.00%	14.85%	-	-	12.69%	-	-	-	-	-	-	-
24	-	-20.64%	100.00%	100.00%	-15.81%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	3.45%	-
37	100.00%	-	100.00%	-	-	-	-	3.49%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	111	99	555	53	135	827
v/c Ratio	0.34	0.43	0.21	0.37	0.05	0.61	0.38
Control Delay	3.0	27.0	3.5	14.8	0.7	34.4	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	27.0	3.5	14.8	0.7	34.4	7.8
Queue Length 50th (ft)	0	32	0	74	0	40	76
Queue Length 95th (ft)	3	75	19	116	5	#91	112
Internal Link Dist (ft)				219			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	323	284	597	1591	1052	297	2236
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.39	0.17	0.35	0.05	0.45	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	76	25	114	166	44	29	234	730	93	929	89
v/c Ratio	0.40	0.15	0.34	0.71	0.24	0.11	0.73	0.32	0.44	0.70	0.14
Control Delay	40.1	35.9	10.5	52.7	37.0	0.9	47.0	13.9	39.5	23.7	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	35.9	10.5	52.7	37.0	0.9	47.0	13.9	39.5	23.7	4.2
Queue Length 50th (ft)	35	11	0	78	20	0	109	77	42	195	0
Queue Length 95th (ft)	79	36	25	#193	53	0	#245	120	90	277	26
Internal Link Dist (ft)		707			498			403		598	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	233	703	1057	233	697	671	320	2330	285	1575	753
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.04	0.11	0.71	0.06	0.04	0.73	0.31	0.33	0.59	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	59	580	157	59	1005
v/c Ratio	0.28	0.19	0.19	0.11	0.27	0.41
Control Delay	17.5	7.4	6.5	0.8	21.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	7.4	6.5	0.8	21.7	4.6
Queue Length 50th (ft)	18	0	17	0	14	53
Queue Length 95th (ft)	36	22	56	10	40	92
Internal Link Dist (ft)	551		598			344
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1365	665	3117	1549	215	2481
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.09	0.19	0.10	0.27	0.41

Intersection Summary

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	117	114	1022	121	110	835
v/c Ratio	0.48	0.49	0.24	0.55	0.10	0.62	0.36
Control Delay	7.9	32.4	5.5	14.7	1.3	43.9	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	32.4	5.5	14.7	1.3	43.9	6.9
Queue Length 50th (ft)	0	41	0	155	0	39	77
Queue Length 95th (ft)	27	#93	30	217	14	#102	111
Internal Link Dist (ft)				216			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	308	259	566	1868	1167	209	2341
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.45	0.20	0.55	0.10	0.53	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	185	30	306	146	28	35	232	1289	65	1222	93
v/c Ratio	0.69	0.21	0.61	0.66	0.20	0.14	0.78	0.47	0.41	0.80	0.12
Control Delay	53.5	42.9	10.6	54.1	42.7	1.2	55.7	14.7	47.5	27.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	53.5	42.9	10.6	54.1	42.7	1.2	55.7	14.8	47.5	27.7	2.1
Queue Length 50th (ft)	106	17	0	82	16	0	130	169	36	314	0
Queue Length 95th (ft)	#222	44	42	#163	42	0	#257	229	79	427	17
Internal Link Dist (ft)		707			588			403		598	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	269	597	1099	232	597	588	299	2716	189	1535	754
Starvation Cap Reductn	0	0	0	0	0	0	0	478	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.05	0.28	0.63	0.05	0.06	0.78	0.58	0.34	0.80	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	402	175	1029	387	154	1014
v/c Ratio	0.51	0.35	0.51	0.31	0.53	0.47
Control Delay	20.4	5.4	15.7	1.4	28.5	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	5.4	15.7	1.4	28.5	7.5
Queue Length 50th (ft)	58	0	97	4	45	80
Queue Length 95th (ft)	92	37	159	25	101	153
Internal Link Dist (ft)	597		598			348
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1129	638	2029	1323	339	2135
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.27	0.51	0.29	0.45	0.47

Intersection Summary

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	118	64	728	93	95	746
v/c Ratio	0.19	0.42	0.13	0.42	0.08	0.51	0.35
Control Delay	1.1	24.7	0.9	12.5	1.3	32.6	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	24.7	0.9	12.5	1.3	32.6	7.2
Queue Length 50th (ft)	0	33	0	92	0	27	64
Queue Length 95th (ft)	0	#76	3	140	11	#77	96
Internal Link Dist (ft)				217			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	373	289	627	1771	1214	216	2378
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.41	0.10	0.41	0.08	0.44	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	136	28	213	181	29	24	206	1023	67	982	117
v/c Ratio	0.40	0.17	0.48	0.71	0.17	0.10	0.71	0.44	0.37	0.73	0.18
Control Delay	36.6	36.8	9.5	50.0	35.9	0.8	47.6	14.7	39.9	24.6	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	36.8	9.5	50.0	35.9	0.8	47.6	14.7	39.9	24.6	4.5
Queue Length 50th (ft)	64	13	0	86	13	0	97	117	31	208	1
Queue Length 95th (ft)	#144	39	34	#193	39	0	#212	164	72	290	32
Internal Link Dist (ft)		707			545			403		597	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	336	704	1205	256	703	708	290	2414	216	1528	745
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.04	0.18	0.71	0.04	0.03	0.71	0.42	0.31	0.64	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	477	249	611	505	240	736
v/c Ratio	0.54	0.42	0.37	0.46	0.76	0.36
Control Delay	20.4	5.1	16.2	4.3	41.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	5.1	16.2	4.3	41.4	7.4
Queue Length 50th (ft)	71	0	59	39	79	63
Queue Length 95th (ft)	109	43	91	77	#185	103
Internal Link Dist (ft)	574		597			347
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1092	673	1654	1194	328	2065
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.37	0.37	0.42	0.73	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Cumulative Conditions – Short Term Baseline

Cumulative Short-Term Conditions - Storage Length

Intersection #	Street Name North-South	Storage Length (feet) NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	200	970	350	280	490	-	65	215	150	95	585	-
2	Taylor Road & Horseshoe Bar Road	100	400	125	190	380	-	-	115	-	-	160	160
3	Horseshoe Bar Road & I-80 Westbound Ramp	85	680	-	160	450	95	-	935	250	275	95	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	2,350	100	-	685	-	-	-	-	-	1,080	-
5	Barton Road & Brace Road	-	2,895	-	-	-	-	-	1,980	-	-	560	-
6	Sierra College Boulevard & Taylor Road	210	550	550	210	1,500	450	150	900	250	215	2,060	215
7	Sierra College Boulevard & Brace Road	-	1,265	200	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	60	230	150
9	Sierra College Boulevard & I-80 WB Ramps	200	1,530	325	-	370	150	530	-	530	740	1,320	740
10	Sierra College Boulevard & I-80 EB Ramps	-	710	280	250	1,530	500	1,315	1,315	205	345	-	330
11	Sierra College Boulevard & Schriber Way	90	395	-	-	300	100	200	200	-	-	415	415
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	75	1,675	45	220	710	200	130	260	-	265	745	150
13	Sierra College Boulevard & Stadium Dwy	200	1,580	-	-	1,690	-	200	-	60	-	-	-
14	Sierra College Boulevard & Rocklin Road	245	650	-	245	1,575	175	240	925	925	315	1,325	-
15	Pacific Street & Dominguez Road/Delmar Avenue	210	1,860	-	200	850	150	-	700	315	-	1,935	140
16	Pacific Street & Rocklin Road	265	420	110	230	410	-	130	285	-	250	330	330
17	Granite Drive & Rocklin Road	100	140	-	325	625	625	225	675	-	135	650	150
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	635	1,165	-	-	580	280	300	555	-
19	I-80 Eastbound Ramps & Rocklin Road	455	1,115	455	-	-	-	170	520	-	-	370	-
20	Aguilar Road & Rocklin Road	320	-	320	-	-	-	75	400	-	85	1,260	-
21	Sierra College Boulevard & Driveway South of Brace Road	135	1,000	-	-	220	-	-	-	60	-	-	-
22	Dominguez Road & Granite Driive	220	1,390	-	-	730	-	370	-	50	-	-	-
23	El Don Drive & Rocklin Road	140	530	-	-	580	95	410	1,260	-	265	1,430	-
24	Sierra College Boulevard & Project Driveway	Does not exist											
25	Brace Road & Project Driveway	Does not exist											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1,900	600	465	2,500	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	4,500	-	100	1,300	-	-	-	-	1,450	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	105	1,100	210	105	3,100	-	-	85	30	-	910	30
29	Taylor Road & English Colony Way-Rock Springs Road	150	1,900	-	140	350	115	-	560	30	-	940	-
30	Taylor Road & Penryn Road (North	85	170	-	-	555	-	55	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	2,600	-	85	180	-	-	-	-	495	-	-
32	Taylor Road & Del Oro High School North Lot	-	185	-	70	1,600	-	-	-	-	200	-	45
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Drop Off	150	300	-	90	190	-	-	50	-	-	75	-
34	Taylor Road & Del Oro High School South Lot	-	1,200	-	150	300	-	-	-	-	65	-	65
35	Taylor Road & Rippey Road	140	465	-	-	610	-	3,500	-	-	-	-	-
36	Taylor Road & Webb Street	185	370	-	160	500	105	-	-	1,070	-	190	-
37	Project Driveway East & Brace Road	Does not exist											

Cumulative-Short Term AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#332**	384	36	#102	208	-	**187**	139	58	**145**	238	-
2	Taylor Road & Horseshoe Bar Road	7	#273	3	**#327**	138	-	-	55	-	-	58	**178**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**162**	194	-	34	201	**98**	-	#155	42	66	80	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	363	-
5	Barton Road & Brace Road	-	18	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	#205	142	34	44	#414	35	**#159**	168	1	#144	157	-
7	Sierra College Boulevard & Brace Road	-	183	-	#111	171	-	-	-	30	80	-	26
8	Sierra College Boulevard & Granite Drive	**#323**	209	29	110	474	23	#133	41	41	**#216**	62	-
9	Sierra College Boulevard & I-80 WB Ramps	**#207**	74	3	-	**428**	3	44	-	43	313	177	96
10	Sierra College Boulevard & I-80 EB Ramps	-	228	-	107	295	7	175	67	152	79	-	61
11	Sierra College Boulevard & Schriber Way	23	104	-	-	**547**	-	23	-	-	-	171	45
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	-	153	-	60	317	-	10	-	-	30	6	-
13	Sierra College Boulevard & Stadium Dwy	68	75	-	-	202	-	14	-	11	-	-	-
14	Sierra College Boulevard & Rocklin Road	**#321**	#331	-	#210	199	39	#157	114	132	#228	190	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#130	#301	-	40	212	10	-	55	41	-	92	10
16	Pacific Street & Rocklin Road	82	264	**#451**	**#437**	277	-	52	93	-	**#508**	**#529**	61
17	Granite Drive & Rocklin Road	26	34	-	177	174	37	#194	391	-	34	#342	**#242**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	53	150	-	-	#400	74	m280	m334	-
19	I-80 Eastbound Ramps & Rocklin Road	**#555**	#468	#422	-	-	-	**m#219**	143	-	-	**#458**	-
20	Aguilar Road & Rocklin Road	131	-	1	-	-	-	64	**489**	-	22	213	-
21	Sierra College Boulevard & Driveway South of Brace Road	2	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	8	-	-	-	-	-	30	-	15	-	-	-
23	El Don Drive & Rocklin Road	**173**	34	-	-	#61	-	**#669**	373	-	29	#467	-
24	Sierra College Boulevard & Project Driveway	DNE											
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	168	15	-	-	-	-	88	423	48	80	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	10	-	-	-	-	-	18	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	3	-	-	70	-
29	Taylor Road & English Colony Way-Rock Springs Road	25	93	-	-	188	25	-	43	**68**	-	58	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	33	-	-	-	-	-	473	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	28	-	-	-	-	-	68	-	20
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dro	-	-	-	15	-	-	-	-	-	-	**560**	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	18	-	-	-	-	-	**165**	-	15
35	Taylor Road & Rippey Road	8	-	-	-	-	-	10	-	-	-	-	-
36	Taylor Road & Webb Street	15	-	-	3	-	-	-	-	55	-	8	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity.

Cumulative-Short Term PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#447**	354	43	#84	214	-	**79**	138	87	**169**	160	-
2	Taylor Road & Horseshoe Bar Road	37	**#557**	18	**#384**	348	-	-	52	-	-	89	**231**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**110**	188	-	63	163	66	-	#172	17	110	64	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	388	-
5	Barton Road & Brace Road	-	25	-	-	-	-	-	-	-	-	3	-
6	Sierra College Boulevard & Taylor Road	**#218**	**#564**	144	44	327	33	**#250**	#282	55	**#273**	296	-
7	Sierra College Boulevard & Brace Road	-	#598	-	#148	187	-	-	-	76	**166**	-	43
8	Sierra College Boulevard & Granite Drive	**#539**	**618**	21	#116	#817	48	**#330**	52	52	**#163**	50	-
9	Sierra College Boulevard & I-80 WB Ramps	**m#761**	m348	m15	-	**#868**	**170**	#376	-	175	273	326	221
10	Sierra College Boulevard & I-80 EB Ramps	-	452	68	m212	m204	m2	366	195	130	**#382**	-	**#882**
11	Sierra College Boulevard & Schriber Way	68	265	-	-	**#658**	23	112	-	-	-	94	73
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	8	373	17	#121	417	-	13	-	-	56	-	-
13	Sierra College Boulevard & Stadium Dwy	30	284	-	-	168	-	41	-	31	-	-	-
14	Sierra College Boulevard & Rocklin Road	**248**	**#914**	-	**#390**	340	111	**#615**	221	200	#134	#409	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#175	#628	-	57	377	-	-	94	50	-	127	-
16	Pacific Street & Rocklin Road	83	**425**	**#790**	**#387**	360	-	63	112	-	**#731**	**#756**	203
17	Granite Drive & Rocklin Road	**76**	45	-	278	275	63	**#365**	373	-	61	#637	**#379**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	54	#338	-	-	#491	143	**#624**	332	-
19	I-80 Eastbound Ramps & Rocklin Road	**#590**	#572	308	-	-	-	**#346**	188	-	-	**#832**	-
20	Aguilar Road & Rocklin Road	78	-	-	-	-	-	58	330	-	30	371	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	4	-	-	-
22	Dominguez Road & Granite Driive	13	-	-	-	-	-	55	-	13	-	-	-
23	El Don Drive & Rocklin Road	106	21	-	-	#283	73	#252	#497	-	36	#498	-
24	Sierra College Boulevard & Project Driveway	DNE											
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	698	35	-	-	-	-	105	153	33	88	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	18	-	-	-	-	-	105	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	8	-	-	135	3
29	Taylor Road & English Colony Way-Rock Springs Road	23	130	-	3	43	15	-	30	20	-	23	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	13	-	-	-	-	-	113	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	8	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dro	-	-	-	-	-	-	-	-	-	-	13	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	55	-	8
35	Taylor Road & Rippey Road	3	-	-	-	-	-	8	-	-	-	-	-
36	Taylor Road & Webb Street	38	-	-	-	-	-	-	-	65	-	18	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity.

Cumulative-Short Term SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#334**	240	31	#44	157	-	**66**	59	46	**177**	83	-
2	Taylor Road & Horseshoe Bar Road	26	**#449**	18	**#289**	367	-	-	33	-	-	94	**92**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**138**	131	-	48	124	**64**	-	#163	6	**78**	**85**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	5	-	-	-	-	-	185	-
5	Barton Road & Brace Road	-	70	-	-	-	-	-	-	-	-	8	-
6	Sierra College Boulevard & Taylor Road	#206	293	96	46	#327	30	**#167**	177	44	**#269**	153	-
7	Sierra College Boulevard & Brace Road	-	#425	-	#111	207	-	-	-	16	**140**	-	14
8	Sierra College Boulevard & Granite Drive	**#408**	**432**	31	100	655	49	**#236**	46	48	**#199**	49	-
9	Sierra College Boulevard & I-80 WB Ramps	**m#944**	m282	m78	-	**#782**	**222**	#509	-	**#587**	296	337	220
10	Sierra College Boulevard & I-80 EB Ramps	-	353	59	**m#347**	m168	-	311	233	126	**#409**	-	**#886**
11	Sierra College Boulevard & Schriber Way	**#124**	214	-	-	**#595**	52	128	-	-	-	95	71
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	5	253	30	#137	351	-	9	-	-	50	5	31
13	Sierra College Boulevard & Stadium Dwy	18	210	-	-	161	-	15	-	15	-	-	-
14	Sierra College Boulevard & Rocklin Road	171	#640	-	**#278**	267	56	**#374**	123	106	#176	182	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#107	208	-	40	232	20	-	59	32	-	45	6
16	Pacific Street & Rocklin Road	30	236	**#261**	**#309**	195	-	44	63	-	**310**	#318	53
17	Granite Drive & Rocklin Road	64	42	-	214	211	56	**#353**	275	-	40	306	**160**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	42	122	-	-	#364	80	**#445**	171	-
19	I-80 Eastbound Ramps & Rocklin Road	#316	#293	149	-	-	-	#168	102	-	-	#367	-
20	Aguilar Road & Rocklin Road	62	-	-	-	-	-	50	222	-	17	217	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	13	-	-	-	-	-	45	-	13	-	-	-
23	El Don Drive & Rocklin Road	80	14	-	-	#56	-	48	#420	-	32	#394	-
24	Sierra College Boulevard & Project Driveway	DNE											
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	320	**43**	-	5	-	-	88	193	318	65	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	5	-	-	-	-	-	38	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	3	-	-	118	-
29	Taylor Road & English Colony Way-Rock Springs Road	48	193	-	3	123	20	-	63	**58**	-	43	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	10	-	-	-	-	-	55	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	-	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dro	-	-	-	3	-	-	-	-	-	-	55	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	-	-	-	-	-	-	50	-	5
35	Taylor Road & Rippey Road	8	-	-	-	-	-	10	-	-	-	-	-
36	Taylor Road & Webb Street	30	-	-	-	-	-	-	-	213	-	175	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	203	146	271	163	300	262	453	110	46	499
v/c Ratio	0.65	0.47	0.56	0.45	0.77	0.77	0.68	0.18	0.70	0.75
Control Delay	43.6	37.9	9.3	34.3	41.9	53.1	31.8	5.9	94.3	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	37.9	9.3	34.3	41.9	53.1	31.8	5.9	94.3	39.0
Queue Length 50th (ft)	100	69	0	75	129	133	200	0	25	120
Queue Length 95th (ft)	187	139	58	145	238	#332	384	36	#102	208
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	604	595	676	598	610	340	769	686	66	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.25	0.40	0.27	0.49	0.77	0.59	0.16	0.70	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Taylor Rd & Horseshoe Bar Rd

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	62	527	2	438	59	460	415
v/c Ratio	0.25	0.23	0.67	0.01	0.69	0.10	0.72	0.28
Control Delay	25.0	28.3	12.5	31.5	25.0	0.6	25.9	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	28.3	12.5	31.5	25.0	0.6	25.9	4.3
Queue Length 50th (ft)	20	23	82	1	153	0	155	39
Queue Length 95th (ft)	55	58	178	7	#273	3	#327	138
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	645	666	981	202	911	805	883	1474
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.54	0.01	0.48	0.07	0.52	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	99	133	55	86	182	631	20	241	398
v/c Ratio	0.70	0.21	0.30	0.43	0.64	0.48	0.15	0.60	0.64
Control Delay	59.0	5.9	39.8	35.3	42.9	19.5	41.4	34.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	5.9	39.8	35.3	42.9	19.5	41.4	34.7	9.7
Queue Length 50th (ft)	46	0	27	32	89	105	10	104	12
Queue Length 95th (ft)	#155	42	66	80	162	194	34	201	98
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	141	641	452	453	479	1710	162	560	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.21	0.12	0.19	0.38	0.37	0.12	0.43	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Sierra College Blvd & Taylor Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	214	110	259	199	22	164	463	220	30	1007	184
v/c Ratio	0.75	0.58	0.24	0.80	0.54	0.05	0.80	0.29	0.21	0.25	0.85	0.21
Control Delay	69.1	36.1	1.3	58.4	34.9	0.2	66.0	16.4	2.2	43.8	35.5	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.1	36.1	1.3	58.4	34.9	0.2	66.0	16.4	2.2	43.8	35.5	2.9
Queue Length 50th (ft)	59	101	0	69	93	0	84	66	0	15	252	0
Queue Length 95th (ft)	#159	168	1	#144	157	0	#205	142	34	44	#414	35
Internal Link Dist (ft)		429			1915			582			306	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	153	517	565	322	509	581	207	1584	1043	123	1179	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.41	0.19	0.80	0.39	0.04	0.79	0.29	0.21	0.24	0.85	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	111	134	101	866	150	1226	1
v/c Ratio	0.29	0.37	0.25	0.49	0.63	0.50	0.00
Control Delay	6.5	22.2	5.4	13.1	35.6	6.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	22.2	5.4	13.1	35.6	6.5	0.0
Queue Length 50th (ft)	0	38	0	104	46	94	0
Queue Length 95th (ft)	30	80	26	183	#111	171	0
Internal Link Dist (ft)				226		582	
Turn Bay Length (ft)	860	100	1000		170		
Base Capacity (vph)	531	544	542	1806	321	2571	1178
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.25	0.19	0.48	0.47	0.48	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	110	24	251	155	43	29	276	726	118	93	1245	97
v/c Ratio	0.49	0.18	0.60	0.79	0.31	0.12	0.82	0.41	0.13	0.53	0.81	0.13
Control Delay	51.4	47.4	12.3	72.2	50.8	1.1	59.8	15.7	3.0	54.8	30.4	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	51.4	47.4	12.3	72.2	50.8	1.1	59.8	16.0	3.0	54.8	30.4	3.0
Queue Length 50th (ft)	69	15	0	101	27	0	175	141	0	59	361	0
Queue Length 95th (ft)	#133	41	41	#216	62	0	#323	209	29	110	474	23
Internal Link Dist (ft)		707			453			403			1015	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	229	515	901	197	513	534	338	1790	885	226	1574	764
Starvation Cap Reductn	0	0	0	0	0	0	0	493	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.05	0.28	0.79	0.08	0.05	0.82	0.56	0.13	0.41	0.79	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	22	98	695	193	180	119	911	216	1686	69
v/c Ratio	0.19	0.37	0.84	0.61	0.50	0.79	0.28	0.21	0.68	0.07
Control Delay	55.9	12.5	53.1	39.6	17.0	81.4	5.7	0.5	22.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0
Total Delay	55.9	12.5	53.1	39.6	17.0	81.4	5.7	0.5	23.9	0.4
Queue Length 50th (ft)	16	10	265	103	26	92	49	0	350	0
Queue Length 95th (ft)	44	43	313	177	96	#207	74	3	428	3
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	124	269	1419	553	563	152	3253	1022	2497	927
Starvation Cap Reductn	0	0	0	0	0	0	0	0	567	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.36	0.49	0.35	0.32	0.78	0.28	0.21	0.87	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	430	120	233	53	128	1168	38	224	1432	340
v/c Ratio	0.62	0.27	0.77	0.45	0.50	0.36	0.04	0.67	0.58	0.30
Control Delay	45.7	48.0	39.8	65.8	18.4	13.3	0.1	51.1	7.2	0.7
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Total Delay	45.7	48.0	39.9	65.8	18.4	13.4	0.1	51.1	7.3	0.7
Queue Length 50th (ft)	158	45	82	41	11	85	0	86	132	0
Queue Length 95th (ft)	175	67	152	79	61	228	m0	107	295	7
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	756	1226	610	121	289	3217	923	413	2466	1136
Starvation Cap Reductn	0	0	0	0	0	809	0	0	0	0
Spillback Cap Reductn	0	0	52	0	0	0	0	0	123	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.10	0.42	0.44	0.44	0.49	0.04	0.54	0.61	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

11: Sierra College Blvd & Schriber Way

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	8	5	148	217	8	1143	1790	14
v/c Ratio	0.09	0.02	0.65	0.61	0.09	0.25	0.70	0.01
Control Delay	55.9	0.2	62.4	13.7	55.9	5.2	8.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	0.2	62.4	13.7	55.9	5.2	8.7	0.0
Queue Length 50th (ft)	6	0	111	0	6	50	70	0
Queue Length 95th (ft)	23	0	171	45	23	104	547	m0
Internal Link Dist (ft)		343	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	265	353	280	385	90	4601	2545	1196
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01	0.53	0.56	0.09	0.25	0.70	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	1	48	1	10	1154	31	50	1915	4
v/c Ratio	0.05	0.00	0.26	0.01	0.05	0.33	0.03	0.39	0.66	0.00
Control Delay	44.5	0.0	45.9	42.0	0.5	7.4	0.0	48.7	5.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Delay	44.5	0.0	45.9	42.0	0.5	7.4	0.0	48.7	6.4	0.0
Queue Length 50th (ft)	2	0	13	1	0	90	0	27	161	0
Queue Length 95th (ft)	10	0	30	6	0	153	0	60	317	0
Internal Link Dist (ft)		226		372		97			363	
Turn Bay Length (ft)	130		265		150		45	220		200
Base Capacity (vph)	65	674	191	720	568	3846	1190	178	2984	1034
Starvation Cap Reductn	0	0	0	0	0	0	0	0	689	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.00	0.25	0.00	0.02	0.30	0.03	0.28	0.83	0.00

Intersection Summary

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	29	11	96	1179	2230
v/c Ratio	0.09	0.07	0.53	0.38	0.63
Control Delay	28.1	16.6	40.8	2.1	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	16.6	40.8	2.1	7.6
Queue Length 50th (ft)	5	0	35	0	106
Queue Length 95th (ft)	14	11	68	75	202
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1016	500	183	3036	3565
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.02	0.52	0.39	0.63

Intersection Summary

14: Sierra College Blvd & Rocklin Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	154	369	357	151	614	518	939	177	998	294
v/c Ratio	0.73	0.35	0.60	1.51	0.75	1.93	0.88	0.90	0.55	0.40
Control Delay	60.2	25.8	15.7	308.7	34.4	458.1	41.1	86.2	25.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	25.8	15.7	308.7	34.4	458.1	41.1	86.2	25.1	4.5
Queue Length 50th (ft)	88	87	70	~126	153	~246	272	105	170	0
Queue Length 95th (ft)	#157	114	132	#228	190	#321	#331	#210	199	39
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	226	1215	660	100	950	268	1078	196	1822	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.30	0.54	1.51	0.65	1.93	0.87	0.90	0.55	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	79	187	152	56	137	524	40	433	52
v/c Ratio	0.34	0.44	0.50	0.14	0.59	0.51	0.27	0.59	0.08
Control Delay	22.4	7.2	25.0	2.3	38.6	13.3	29.9	17.5	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	7.2	25.0	2.3	38.6	13.3	29.9	17.5	1.8
Queue Length 50th (ft)	22	0	44	0	43	78	12	105	0
Queue Length 95th (ft)	55	41	92	10	#130	#301	40	212	10
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	569	761	721	843	231	1031	146	849	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.21	0.07	0.59	0.51	0.27	0.51	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	213	384	398	156	50	551	649	327	700
v/c Ratio	0.21	0.59	0.84	0.85	0.29	0.42	0.61	0.91	0.86	0.48
Control Delay	55.7	39.2	59.7	60.7	8.8	66.4	41.6	32.5	68.1	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	39.2	59.7	60.7	8.8	66.4	41.6	32.5	68.1	26.1
Queue Length 50th (ft)	21	52	305	317	7	38	195	198	252	206
Queue Length 95th (ft)	52	93	#508	#529	61	82	264	#451	#437	277
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	364	853	456	466	533	134	1006	752	380	1477
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.25	0.84	0.85	0.29	0.37	0.55	0.86	0.86	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	177	1137	20	913	641	14	25	213	209	164
v/c Ratio	0.71	0.67	0.20	0.79	0.80	0.08	0.16	0.64	0.62	0.36
Control Delay	54.1	21.9	45.8	33.6	16.6	39.8	33.5	39.7	38.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	21.9	45.8	33.6	16.6	39.8	33.5	39.7	38.8	6.2
Queue Length 50th (ft)	93	215	11	235	77	7	9	111	108	0
Queue Length 95th (ft)	#194	391	34	#342	#242	26	34	177	174	37
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	259	1701	102	1163	810	169	157	596	602	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.67	0.20	0.79	0.79	0.08	0.16	0.36	0.35	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: I-80 WB Ramps & Rocklin Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1000	582	462	1369	52	247
v/c Ratio	0.75	0.62	0.85	0.53	0.20	0.78
Control Delay	30.7	5.6	30.9	10.0	32.2	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	5.6	30.9	10.0	32.2	38.7
Queue Length 50th (ft)	267	0	226	212	26	85
Queue Length 95th (ft)	#400	74	m280	m334	53	150
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1333	933	549	2607	443	466
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.62	0.84	0.53	0.12	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: I-80 EB Ramps & Rocklin Rd

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	226	814	1149	579	555	540
v/c Ratio	0.90	0.43	0.92	0.95	0.87	0.84
Control Delay	81.7	12.3	40.4	56.1	36.3	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.7	12.3	40.4	56.1	36.3	32.5
Queue Length 50th (ft)	141	66	323	331	246	221
Queue Length 95th (ft)	m#219	143	#458	#555	#468	#422
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	255	1903	1254	608	636	645
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.43	0.92	0.95	0.87	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	56	1784	11	1026	161	29
v/c Ratio	0.31	0.76	0.09	0.49	0.53	0.10
Control Delay	37.4	12.2	36.1	10.4	33.7	0.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	37.4	12.5	36.1	10.4	33.7	0.6
Queue Length 50th (ft)	20	199	4	138	57	0
Queue Length 95th (ft)	64	489	22	213	131	1
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	186	2593	124	2520	551	488
Starvation Cap Reductn	0	273	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.77	0.09	0.41	0.29	0.06

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	570	1047	13	837	175	36	44	41
v/c Ratio	0.89	0.46	0.13	0.88	0.60	0.12	0.45	0.20
Control Delay	49.4	12.1	50.4	47.2	47.7	19.8	42.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	12.1	50.4	47.2	47.7	19.8	42.1	2.1
Queue Length 50th (ft)	339	146	8	264	107	8	11	0
Queue Length 95th (ft)	#669	373	29	#467	173	34	#61	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	642	2323	103	953	535	526	97	210
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.45	0.13	0.88	0.33	0.07	0.45	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: Taylor Rd & King Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	71	137	464	169	173	396	460	202	54	495
v/c Ratio	0.29	0.53	0.75	0.65	0.63	0.79	0.54	0.26	0.45	0.74
Control Delay	37.9	43.4	12.2	47.9	43.0	43.9	22.8	3.9	56.1	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	43.4	12.2	47.9	43.0	43.9	22.8	3.9	56.1	40.0
Queue Length 50th (ft)	35	70	0	87	79	196	181	0	29	126
Queue Length 95th (ft)	79	138	87	169	160	#447	354	43	#84	214
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	567	603	821	573	578	502	887	819	125	825
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.23	0.57	0.29	0.30	0.79	0.52	0.25	0.43	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Taylor Rd & Horseshoe Bar Rd

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	58	91	479	23	686	85	413	739
v/c Ratio	0.23	0.42	0.68	0.18	0.85	0.12	0.80	0.52
Control Delay	26.2	38.7	18.7	41.1	32.8	2.5	41.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	38.7	18.7	41.1	32.8	2.5	41.1	8.4
Queue Length 50th (ft)	19	44	136	11	301	0	199	108
Queue Length 95th (ft)	52	89	231	37	#557	18	#384	348
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	462	403	757	143	971	835	587	1416
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.23	0.63	0.16	0.71	0.10	0.70	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	115	81	112	101	112	606	49	203	354
v/c Ratio	0.77	0.13	0.50	0.38	0.52	0.59	0.33	0.48	0.56
Control Delay	64.2	2.6	41.5	19.9	42.2	23.9	42.6	30.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	2.6	41.5	19.9	42.2	23.9	42.6	30.5	7.0
Queue Length 50th (ft)	50	0	51	16	51	123	22	83	0
Queue Length 95th (ft)	#172	17	110	64	110	188	63	163	66
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	149	647	455	480	469	1662	175	570	733
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.13	0.25	0.21	0.24	0.36	0.28	0.36	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Sierra College Blvd & Taylor Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	212	317	182	521	340	49	157	1261	487	26	844	181
v/c Ratio	0.83	0.77	0.37	0.94	0.75	0.10	0.87	0.85	0.45	0.31	0.80	0.21
Control Delay	67.9	48.9	7.9	68.1	45.4	0.4	86.3	34.5	6.3	55.3	38.0	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	48.9	7.9	68.1	45.4	0.4	86.3	34.5	6.3	55.3	38.0	2.9
Queue Length 50th (ft)	133	187	3	172	199	0	101	350	53	16	258	1
Queue Length 95th (ft)	#250	#282	55	#273	296	0	#218	#564	144	44	327	33
Internal Link Dist (ft)		429			1915			582			355	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	268	455	521	553	487	526	180	1475	1086	85	1108	867
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.70	0.35	0.94	0.70	0.09	0.87	0.85	0.45	0.31	0.76	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	148	207	126	1838	113	1322
v/c Ratio	0.42	0.68	0.34	0.90	0.85	0.53
Control Delay	17.0	42.7	8.6	22.6	85.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	42.7	8.6	22.6	85.3	6.5
Queue Length 50th (ft)	25	96	0	397	57	142
Queue Length 95th (ft)	76	166	43	#598	#148	187
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)	860	100	1000		170	
Base Capacity (vph)	378	337	399	2038	137	2507
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.61	0.32	0.90	0.82	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	28	391	114	26	35	381	1666	73	65	1544	124
v/c Ratio	0.90	0.21	0.70	0.66	0.22	0.18	1.00	0.73	0.07	0.59	0.93	0.16
Control Delay	93.0	57.2	12.4	72.3	58.8	2.0	94.4	18.2	2.8	78.6	42.4	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.0
Total Delay	93.0	57.2	12.4	72.3	58.8	2.0	94.4	30.8	2.8	78.6	42.4	6.4
Queue Length 50th (ft)	160	21	0	87	20	0	~304	459	1	51	591	11
Queue Length 95th (ft)	#330	52	52	#163	50	0	#539	618	21	#116	#817	48
Internal Link Dist (ft)		707			453			403			1015	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	222	461	983	189	449	454	381	2286	1023	113	1656	790
Starvation Cap Reductn	0	0	0	0	0	0	0	628	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.06	0.40	0.60	0.06	0.08	1.00	1.00	0.07	0.58	0.93	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	213	327	591	258	237	445	1602	417	1816	222
v/c Ratio	0.67	0.53	0.46	0.87	0.71	1.32	0.58	0.40	1.13	0.38
Control Delay	69.6	19.6	36.3	81.3	43.6	206.8	20.0	1.7	113.5	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	69.6	19.6	36.3	81.3	43.6	206.8	20.0	1.7	114.1	23.5
Queue Length 50th (ft)	197	119	222	238	132	~565	319	2	~756	91
Queue Length 95th (ft)	#376	175	273	326	221	m#761	m348	m15	#868	170
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	317	618	1323	443	456	337	2758	1055	1603	589
Starvation Cap Reductn	0	0	0	0	0	0	0	0	262	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.53	0.45	0.58	0.52	1.32	0.58	0.40	1.35	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	657	291	159	209	488	1919	186	414	1271	484
v/c Ratio	0.76	0.77	0.62	1.00	1.50	0.65	0.22	0.68	0.54	0.39
Control Delay	58.0	79.5	34.9	127.0	274.1	31.5	6.6	47.3	7.2	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	48.0	0.9	0.0	0.0	0.0
Total Delay	58.0	79.5	34.9	127.0	274.1	79.5	7.6	47.3	7.2	0.8
Queue Length 50th (ft)	308	148	53	208	~643	394	21	188	192	2
Queue Length 95th (ft)	366	195	130	#382	#882	452	68	m212	m204	m2
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	895	1010	516	209	326	2955	835	606	2368	1237
Starvation Cap Reductn	0	0	0	0	0	1275	425	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.29	0.31	1.00	1.50	1.14	0.45	0.68	0.54	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Sierra College Blvd & Schriber Way

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	105	55	82	170	52	2112	1478	98
v/c Ratio	0.53	0.13	0.46	0.58	0.34	0.51	0.77	0.11
Control Delay	50.8	0.7	50.2	18.0	48.6	10.1	24.2	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	19.2	0.0
Total Delay	50.8	0.7	50.2	18.0	48.6	10.4	43.4	2.8
Queue Length 50th (ft)	64	0	50	12	32	179	386	0
Queue Length 95th (ft)	112	0	94	73	68	265	#658	23
Internal Link Dist (ft)		220	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	318	498	324	410	151	4130	1924	913
Starvation Cap Reductn	0	0	0	0	0	1254	483	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.11	0.25	0.41	0.34	0.73	1.03	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	1	116	76	2	2083	92	87	1529	1
v/c Ratio	0.04	0.00	0.36	0.23	0.02	0.68	0.09	0.66	0.59	0.00
Control Delay	36.0	0.0	35.8	1.7	35.5	12.7	1.8	60.8	8.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	36.0	0.0	35.8	1.7	35.5	12.7	1.8	60.8	9.1	0.0
Queue Length 50th (ft)	2	0	25	0	1	206	0	39	120	0
Queue Length 95th (ft)	13	0	56	0	8	373	17	#121	417	0
Internal Link Dist (ft)		226				97			363	
Turn Bay Length (ft)	130		265	150	75		45	220		200
Base Capacity (vph)	116	730	355	834	116	3061	996	131	2570	1167
Starvation Cap Reductn	0	0	0	0	0	0	0	0	611	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.00	0.33	0.09	0.02	0.68	0.09	0.66	0.78	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	125	78	27	1889	1547
v/c Ratio	0.28	0.28	0.17	0.70	0.44
Control Delay	25.6	9.6	28.4	7.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	9.6	28.4	7.1	6.7
Queue Length 50th (ft)	21	0	9	173	65
Queue Length 95th (ft)	41	31	30	284	168
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1113	566	161	2705	3538
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.17	0.70	0.44

Intersection Summary

14: Sierra College Blvd & Rocklin Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	409	443	442	75	603	437	1496	226	1069	302
v/c Ratio	1.11	0.44	0.64	0.65	1.14	0.76	1.08	1.08	0.61	0.44
Control Delay	127.1	41.4	15.3	87.5	125.4	63.0	89.1	140.2	38.9	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.1	41.4	15.3	87.5	125.4	63.0	89.1	140.2	38.9	9.4
Queue Length 50th (ft)	~407	168	77	65	~284	188	~771	~220	289	33
Queue Length 95th (ft)	#615	221	200	#134	#409	248	#914	#390	340	111
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	370	996	686	120	531	610	1381	209	1750	688
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.44	0.64	0.63	1.14	0.72	1.08	1.08	0.61	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	107	199	149	51	167	826	45	570	40
v/c Ratio	0.43	0.42	0.60	0.13	0.63	0.78	0.31	0.73	0.06
Control Delay	32.9	7.2	38.4	0.7	43.5	20.8	42.6	24.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	7.2	38.4	0.7	43.5	20.8	42.6	24.4	0.2
Queue Length 50th (ft)	47	0	68	0	78	296	22	207	0
Queue Length 95th (ft)	94	50	127	0	#175	#628	57	377	0
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	464	716	468	643	305	1176	145	987	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.28	0.32	0.08	0.55	0.70	0.31	0.58	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	173	506	521	404	46	863	783	218	804
v/c Ratio	0.22	0.56	0.98	1.00	0.60	0.43	0.69	1.01	1.08	0.54
Control Delay	60.0	62.3	82.6	86.8	16.0	73.5	40.2	59.8	140.8	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	62.3	82.6	86.8	16.0	73.5	40.2	59.8	140.8	31.1
Queue Length 50th (ft)	28	72	460	~477	85	39	333	~486	~210	278
Queue Length 95th (ft)	63	112	#731	#756	203	83	425	#790	#387	360
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	363	721	514	519	677	121	1258	776	202	1500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.24	0.98	1.00	0.60	0.38	0.69	1.01	1.08	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	270	999	38	1217	545	51	31	288	285	292
v/c Ratio	0.93	0.58	0.35	0.99	0.79	0.41	0.23	0.72	0.71	0.49
Control Delay	82.0	22.7	57.3	59.5	24.4	58.6	39.5	46.8	46.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	22.7	57.3	59.5	24.4	58.6	39.5	46.8	46.0	6.5
Queue Length 50th (ft)	178	264	24	~421	159	33	13	183	180	0
Queue Length 95th (ft)	#365	373	61	#637	#379	76	45	278	275	63
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	291	1731	114	1224	691	123	133	526	530	698
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.58	0.33	0.99	0.79	0.41	0.23	0.55	0.54	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: I-80 WB Ramps & Rocklin Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1029	557	607	1541	48	344
v/c Ratio	1.01	0.70	0.97	0.64	0.13	0.91
Control Delay	66.3	10.0	63.4	10.2	31.7	62.5
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	66.3	10.0	63.4	10.6	31.7	62.5
Queue Length 50th (ft)	~348	29	~400	266	24	182
Queue Length 95th (ft)	#491	143	#624	332	54	#338
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1022	798	625	2414	415	403
Starvation Cap Reductn	0	0	0	367	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.70	0.97	0.75	0.12	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

19: I-80 EB Ramps & Rocklin Rd

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	238	875	1672	447	435	409
v/c Ratio	0.96	0.38	0.98	0.99	0.97	0.75
Control Delay	98.4	10.2	48.1	84.7	75.8	31.3
Queue Delay	0.0	0.0	41.1	0.0	0.0	0.0
Total Delay	98.4	10.2	89.2	84.7	75.8	31.3
Queue Length 50th (ft)	186	151	647	364	337	174
Queue Length 95th (ft)	#346	188	#832	#590	#572	308
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	249	2329	1708	450	447	545
Starvation Cap Reductn	0	0	372	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.38	1.25	0.99	0.97	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	57	1508	22	1596	95	21
v/c Ratio	0.31	0.60	0.13	0.66	0.37	0.07
Control Delay	34.7	9.0	32.1	11.2	30.8	0.5
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	34.7	9.3	32.1	11.2	30.8	0.5
Queue Length 50th (ft)	23	120	9	239	37	0
Queue Length 95th (ft)	58	330	30	371	78	0
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	186	2498	170	2420	626	607
Starvation Cap Reductn	0	369	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.71	0.13	0.66	0.15	0.03

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	195	1166	20	1056	133	28	237	227
v/c Ratio	0.79	0.68	0.18	0.87	0.44	0.10	0.96	0.58
Control Delay	58.1	20.4	42.2	34.8	33.2	11.8	75.3	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	20.4	42.2	34.8	33.2	11.8	75.3	12.2
Queue Length 50th (ft)	90	175	9	235	59	1	81	0
Queue Length 95th (ft)	#252	#497	36	#498	106	21	#283	73
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	248	1727	113	1216	678	633	247	390
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.68	0.18	0.87	0.20	0.04	0.96	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: Taylor Rd & King Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	60	341	243	115	332	393	196	27	467
v/c Ratio	0.34	0.30	0.71	0.67	0.32	0.85	0.47	0.25	0.35	0.68
Control Delay	36.0	35.2	12.9	37.3	25.5	51.8	18.9	4.0	52.3	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	35.2	12.9	37.3	25.5	51.8	18.9	4.0	52.3	32.3
Queue Length 50th (ft)	28	24	0	96	37	135	101	0	11	94
Queue Length 95th (ft)	66	59	46	177	83	#334	240	31	#44	157
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	669	668	818	716	703	392	895	818	77	1022
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.42	0.34	0.16	0.85	0.44	0.24	0.35	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Taylor Rd & Horseshoe Bar Rd

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	116	295	17	635	98	356	757
v/c Ratio	0.15	0.48	0.42	0.11	0.81	0.14	0.75	0.55
Control Delay	22.4	34.6	9.3	34.9	29.1	2.7	36.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	34.6	9.3	34.9	29.1	2.7	36.8	8.6
Queue Length 50th (ft)	11	49	46	7	240	0	147	116
Queue Length 95th (ft)	33	94	92	26	#449	18	#289	367
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	524	448	773	168	973	838	570	1384
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.38	0.10	0.65	0.12	0.62	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	112	65	72	106	154	458	34	151	353
v/c Ratio	0.67	0.10	0.37	0.47	0.58	0.38	0.24	0.42	0.59
Control Delay	49.0	1.2	38.4	30.6	39.6	18.4	40.1	30.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	1.2	38.4	30.6	39.6	18.4	40.1	30.8	7.9
Queue Length 50th (ft)	37	0	28	27	60	66	13	58	0
Queue Length 95th (ft)	#163	6	78	85	138	131	48	124	64
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	167	647	471	493	509	1793	166	595	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.10	0.15	0.22	0.30	0.26	0.20	0.25	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Sierra College Blvd & Taylor Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	148	229	145	538	204	26	150	818	504	31	811	131
v/c Ratio	0.69	0.57	0.32	0.94	0.43	0.05	0.91	0.60	0.44	0.29	0.80	0.16
Control Delay	53.5	35.3	6.9	63.4	29.4	0.2	91.3	24.3	4.1	46.7	35.9	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	35.3	6.9	63.4	29.4	0.2	91.3	24.3	4.1	46.7	35.9	3.3
Queue Length 50th (ft)	75	109	0	146	91	0	80	161	19	16	206	0
Queue Length 95th (ft)	#167	177	44	#269	153	0	#206	293	96	46	#327	30
Internal Link Dist (ft)		429			1915			582			326	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	233	542	555	570	595	603	165	1366	1133	108	1027	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.26	0.94	0.34	0.04	0.91	0.60	0.44	0.29	0.79	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	72	224	69	1551	90	1372
v/c Ratio	0.20	0.62	0.18	0.85	0.83	0.60
Control Delay	3.6	30.9	3.2	19.5	85.2	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	30.9	3.2	19.5	85.2	8.2
Queue Length 50th (ft)	0	78	0	254	36	143
Queue Length 95th (ft)	16	140	14	#425	#111	207
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)	860	100	1000		170	
Base Capacity (vph)	458	420	423	1827	109	2299
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.53	0.16	0.85	0.83	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	147	24	310	123	25	24	314	1338	102	67	1470	131
v/c Ratio	0.72	0.19	0.64	0.75	0.24	0.12	0.85	0.59	0.10	0.49	0.86	0.16
Control Delay	73.1	56.9	12.5	82.3	60.2	1.3	68.3	15.4	3.7	65.6	34.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Total Delay	73.1	56.9	12.5	82.3	60.2	1.3	68.3	17.4	3.7	65.6	34.1	6.2
Queue Length 50th (ft)	115	18	0	96	19	0	240	321	6	51	522	13
Queue Length 95th (ft)	#236	46	48	#199	49	0	#408	432	31	100	655	49
Internal Link Dist (ft)		707			453			403			1015	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	205	468	944	163	432	476	369	2253	1024	175	1718	816
Starvation Cap Reductn	0	0	0	0	0	0	0	724	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.05	0.33	0.75	0.06	0.05	0.85	0.88	0.10	0.38	0.86	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	255	573	628	262	230	594	1235	435	1651	272
v/c Ratio	1.43	0.85	0.60	0.86	0.71	1.10	0.39	0.38	1.18	0.51
Control Delay	268.3	39.5	44.8	81.5	44.5	113.8	16.3	3.8	132.3	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Total Delay	268.3	39.5	44.8	81.5	44.5	113.8	16.3	3.8	132.7	29.8
Queue Length 50th (ft)	~327	285	261	249	131	~638	228	42	~685	130
Queue Length 95th (ft)	#509	#587	296	337	220	m#944	m282	m78	#782	222
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	178	677	1373	463	451	542	3138	1134	1404	536
Starvation Cap Reductn	0	0	0	0	0	0	0	0	142	51
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.43	0.85	0.46	0.57	0.51	1.10	0.39	0.38	1.31	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	630	373	165	245	556	1384	238	631	1160	367
v/c Ratio	0.61	0.81	0.56	0.97	1.35	0.59	0.31	0.87	0.53	0.33
Control Delay	45.8	75.3	29.7	110.2	207.6	37.5	4.8	54.7	8.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	5.5	0.7	0.0	0.0	0.0
Total Delay	45.8	75.3	29.7	110.2	207.6	43.0	5.5	54.7	8.0	0.6
Queue Length 50th (ft)	263	184	52	235	~636	299	1	314	148	0
Queue Length 95th (ft)	311	233	126	#409	#886	353	59	m#347	m168	m0
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	1039	1018	521	257	413	2329	761	729	2184	1106
Starvation Cap Reductn	0	0	0	0	0	876	268	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.37	0.32	0.95	1.35	0.95	0.48	0.87	0.53	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Sierra College Blvd & Schriber Way

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	142	79	94	185	84	1609	1347	155
v/c Ratio	0.58	0.16	0.57	0.55	0.47	0.44	0.90	0.21
Control Delay	45.3	0.7	49.1	14.9	49.0	12.1	36.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	34.0	0.0
Total Delay	45.3	0.7	49.1	14.9	49.0	12.1	70.3	6.6
Queue Length 50th (ft)	77	0	51	15	45	136	379	10
Queue Length 95th (ft)	128	0	95	71	#124	214	#595	52
Internal Link Dist (ft)		235	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	354	559	240	425	179	3641	1498	743
Starvation Cap Reductn	0	0	0	0	0	0	239	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.14	0.39	0.44	0.47	0.44	1.07	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	3	118	1	105	1	1564	130	126	1369	5
v/c Ratio	0.02	0.01	0.31	0.00	0.36	0.01	0.58	0.14	0.61	0.53	0.00
Control Delay	30.3	0.0	29.8	27.0	8.3	30.0	12.4	3.3	43.3	8.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Total Delay	30.3	0.0	29.8	27.0	8.3	30.0	12.4	3.3	43.3	8.3	0.0
Queue Length 50th (ft)	1	0	21	0	0	0	138	2	46	95	0
Queue Length 95th (ft)	9	0	50	5	31	5	253	30	#137	351	0
Internal Link Dist (ft)		226		372			97			363	
Turn Bay Length (ft)	130		265		150	75		45	220		200
Base Capacity (vph)	144	912	398	1062	960	144	2712	908	207	2572	1181
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	431	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.30	0.00	0.11	0.01	0.58	0.14	0.61	0.64	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	40	22	16	1747	1570
v/c Ratio	0.10	0.11	0.09	0.60	0.40
Control Delay	21.6	11.1	23.3	5.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	11.1	23.3	5.0	4.9
Queue Length 50th (ft)	7	0	6	132	60
Queue Length 95th (ft)	15	15	18	210	161
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1203	585	172	2897	3914
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.09	0.60	0.40

Intersection Summary

14: Sierra College Blvd & Rocklin Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	313	313	351	99	506	367	1300	197	1024	253
v/c Ratio	0.93	0.31	0.53	0.97	0.81	0.70	1.04	0.96	0.64	0.39
Control Delay	76.7	29.9	9.2	131.5	40.6	49.1	69.7	101.2	32.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.7	29.9	9.2	131.5	40.6	49.1	69.7	101.2	32.9	5.4
Queue Length 50th (ft)	209	85	26	68	121	121	~503	134	218	0
Queue Length 95th (ft)	#374	123	106	#176	182	171	#640	#278	267	56
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	342	1059	676	102	661	553	1251	205	1611	653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.30	0.52	0.97	0.77	0.66	1.04	0.96	0.64	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	89	107	62	46	118	494	44	532	89
v/c Ratio	0.38	0.30	0.29	0.13	0.60	0.44	0.27	0.60	0.11
Control Delay	24.3	7.4	22.6	1.7	39.3	10.1	27.7	14.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	7.4	22.6	1.7	39.3	10.1	27.7	14.8	3.2
Queue Length 50th (ft)	25	0	17	0	36	59	13	118	0
Queue Length 95th (ft)	59	32	45	6	#107	208	40	232	20
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	676	838	622	857	198	1122	161	921	811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.13	0.10	0.05	0.60	0.44	0.27	0.58	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	31	138	367	374	247	15	661	593	212	594
v/c Ratio	0.18	0.38	0.73	0.75	0.39	0.18	0.64	0.79	1.30	0.40
Control Delay	39.7	36.2	37.7	38.4	5.3	47.3	30.2	18.4	207.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	36.2	37.7	38.4	5.3	47.3	30.2	18.4	207.1	19.6
Queue Length 50th (ft)	17	34	193	197	0	9	170	94	~163	116
Queue Length 95th (ft)	44	63	310	#318	53	30	236	#261	#309	195
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	597	1176	562	563	687	85	1139	783	163	1479
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.12	0.65	0.66	0.36	0.18	0.58	0.76	1.30	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	278	795	23	769	536	46	39	254	251	272
v/c Ratio	0.93	0.47	0.21	0.73	0.70	0.32	0.25	0.64	0.63	0.48
Control Delay	77.0	19.1	46.6	33.3	10.8	47.2	27.9	38.2	37.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	19.1	46.6	33.3	10.8	47.2	27.9	38.2	37.8	6.4
Queue Length 50th (ft)	154	133	12	196	32	25	8	135	133	0
Queue Length 95th (ft)	#353	275	40	306	160	64	42	214	211	56
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	298	1680	113	1113	786	145	157	627	629	747
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.47	0.20	0.69	0.68	0.32	0.25	0.41	0.40	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: I-80 WB Ramps & Rocklin Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	856	503	538	1163	35	204
v/c Ratio	0.70	0.58	0.84	0.42	0.16	0.73
Control Delay	31.3	5.7	39.1	4.5	34.5	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	5.7	39.1	4.5	34.5	34.3
Queue Length 50th (ft)	221	0	269	88	18	58
Queue Length 95th (ft)	#364	80	#445	171	42	122
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1225	868	644	2743	443	478
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.58	0.84	0.42	0.08	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

19: I-80 EB Ramps & Rocklin Rd

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	184	756	1270	403	390	366
v/c Ratio	0.81	0.36	0.88	0.89	0.85	0.67
Control Delay	56.6	7.5	27.0	47.2	38.0	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	7.5	27.0	47.2	38.0	16.6
Queue Length 50th (ft)	72	72	235	160	132	57
Queue Length 95th (ft)	#168	102	#367	#316	#293	149
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	233	2119	1438	458	464	548
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.36	0.88	0.88	0.84	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

20: Aguilar Rd & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	64	1182	13	1143	99	17
v/c Ratio	0.28	0.49	0.06	0.54	0.33	0.05
Control Delay	25.5	7.3	22.8	10.5	22.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	7.3	22.8	10.5	22.5	0.2
Queue Length 50th (ft)	18	74	4	133	28	0
Queue Length 95th (ft)	50	222	17	217	62	0
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	230	2403	211	2135	806	777
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.49	0.06	0.54	0.12	0.02

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	35	1084	20	1040	115	17	57	54
v/c Ratio	0.21	0.53	0.12	0.53	0.32	0.05	0.34	0.17
Control Delay	35.1	15.1	34.3	16.5	23.8	10.8	24.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	15.1	34.3	16.5	23.8	10.8	24.5	1.2
Queue Length 50th (ft)	11	121	6	115	34	0	7	0
Queue Length 95th (ft)	48	#420	32	#394	80	14	#56	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	167	2063	167	1984	1004	858	166	317
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.53	0.12	0.52	0.11	0.02	0.34	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Cumulative Conditions – Short Term Plus Project

Project Driveway Option A

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	200	970	350	280	490	-	65	215	150	95	585	-
2	Taylor Road & Horseshoe Bar Road	100	400	125	190	380	-	-	115	-	-	160	160
3	Horseshoe Bar Road & I-80 Westbound Ramp	85	680	-	160	450	95	-	935	250	275	95	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	2,350	100	-	685	-	-	-	-	-	1,080	-
5	Barton Road & Brace Road	-	2,895	-	-	-	-	-	1,980	-	-	560	-
6	Sierra College Boulevard & Taylor Road	210	550	550	210	1,500	450	150	900	250	215	2,060	215
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	60	230	150
9	Sierra College Boulevard & I-80 WB Ramps	200	1,530	325	-	370	150	530	-	530	740	1,320	740
10	Sierra College Boulevard & I-80 EB Ramps	-	710	280	250	1,530	500	1,315	1,315	205	345	-	330
11	Sierra College Boulevard & Schriber Way	90	395	-	-	300	100	200	200	-	-	415	415
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	75	1,675	45	220	710	200	130	260	-	265	745	150
13	Sierra College Boulevard & Stadium Dwy	200	1,580	-	-	1,690	-	200	-	60	-	-	-
14	Sierra College Boulevard & Rocklin Road	245	650	-	245	1,575	175	240	925	925	315	1,325	-
15	Pacific Street & Dominguez Road/Delmar Avenue	210	1,860	-	200	850	150	-	700	315	-	1,935	140
16	Pacific Street & Rocklin Road	265	420	110	230	410	-	130	285	-	250	330	330
17	Granite Drive & Rocklin Road	100	140	-	325	625	625	225	675	-	135	650	150
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	635	1,165	-	-	580	280	300	555	-
19	I-80 Eastbound Ramps & Rocklin Road	455	1,115	455	-	-	-	170	520	-	-	370	-
20	Aguilar Road & Rocklin Road	320	-	320	-	-	-	75	400	-	85	1,260	-
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
22	Dominguez Road & Granite Driive	220	1,390	-	-	730	-	370	-	50	-	-	-
23	El Don Drive & Rocklin Road	140	530	-	-	580	95	410	1,260	-	265	1,430	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1,900	600	465	2,500	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	4,500	-	100	1,300	-	-	-	-	1,450	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	105	1,100	210	105	3,100	-	-	85	30	-	910	30
29	Taylor Road & English Colony Way-Rock Springs Road	150	1,900	-	140	350	115	-	560	30	-	940	-
30	Taylor Road & Penryn Road (North	85	170	-	-	555	-	55	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	2,600	-	85	180	-	-	-	-	495	-	-
32	Taylor Road & Del Oro High School North Lot	-	185	-	70	1,600	-	-	-	-	200	-	45
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Drop Off	150	300	-	90	190	-	-	50	-	-	75	-
34	Taylor Road & Del Oro High School South Lot	-	1,200	-	150	300	-	-	-	-	65	-	65
35	Taylor Road & Rippey Road	140	465	-	-	610	-	3,500	-	-	-	-	-
36	Taylor Road & Webb Street	0	150	0	0	0	0	0	0	0	150	0	0
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative-Short TermP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#335**	385	36	#102	210	-	**187**	139	58	**147**	238	-
2	Taylor Road & Horseshoe Bar Road	7	#284	3	**#327**	141	-	-	55	-	-	58	**180**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**162**	194	-	34	201	**98**	-	#155	42	66	80	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	8	-	-	-	-	-	365	-	-
5	Barton Road & Brace Road	18	-	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	**#215**	144	34	44	#418	35	**#159**	168	6	#150	157	-
7	Sierra College Boulevard & Brace Road	-	101	15	#107	190	-	-	-	-	#97	-	17
8	Sierra College Boulevard & Granite Drive	**325**	336	39	138	**#878**	51	162	52	47	**205**	76	-
9	Sierra College Boulevard & I-80 WB Ramps	**m#202**	83	5	-	**477**	4	45	-	63	313	196	140
10	Sierra College Boulevard & I-80 EB Ramps	-	231	-	105	303	11	200	67	152	80	-	60
11	Sierra College Boulevard & Schriber Way	23	105	-	-	**573**	-	23	-	-	-	171	45
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	-	154	-	60	322	-	10	-	-	30	6	-
13	Sierra College Boulevard & Stadium Dwy	68	76	-	-	205	-	14	-	11	-	-	-
14	Sierra College Boulevard & Rocklin Road	**#321**	#340	-	#211	201	39	#162	114	132	#228	191	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#130	#308	-	40	218	10	-	55	41	-	92	10
16	Pacific Street & Rocklin Road	82	266	**#458**	**#437**	281	-	57	93	-	**#511**	**#532**	61
17	Granite Drive & Rocklin Road	26	34	-	177	174	39	#199	391	-	34	#342	**#242**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	53	150	-	-	#400	74	m280	m334	-
19	I-80 Eastbound Ramps & Rocklin Road	**#555**	#468	#422	-	-	-	**m#219**	143	-	-	**#458**	-
20	Aguilar Road & Rocklin Road	131	-	2	-	-	-	64	**489**	-	24	213	-
21	Sierra College Boulevard & Driveway South of Brace Road	2	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	8	-	-	-	-	-	30	-	15	-	-	-
23	El Don Drive & Rocklin Road	**173**	35	-	-	#61	-	**#669**	373	-	30	#468	-
24	Sierra College Boulevard & Project Driveway	-	91	10	45	179	-	-	-	-	43	-	24
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	173	15	-	-	-	-	88	435	48	80	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	10	-	-	-	-	-	18	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	3	-	-	75	-
29	Taylor Road & English Colony Way-Rock Springs Road	25	93	-	-	190	25	-	43	**68**	-	58	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	33	-	-	-	-	-	478	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	28	-	-	-	-	-	68	-	20
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dro	0	-	-	15	-	-	-	-	-	-	**568**	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	18	-	-	-	-	-	**165**	-	18
35	Taylor Road & Rippey Road	8	-	-	-	-	-	10	-	-	-	-	-
36	Taylor Road & Webb Street	15	-	-	3	-	-	-	-	55	-	8	-
37	Project Driveway East & Brace Road	-	0	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#469**	374	45	#86	224	-	**80**	138	87	**174**	162	-
2	Taylor Road & Horseshoe Bar Road	37	**#590**	18	**#384**	369	-	-	52	-	-	89	**236**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**110**	188	-	63	163	66	-	#172	17	110	64	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	388	-
5	Barton Road & Brace Road	-	25	-	-	-	-	-	-	-	-	3	-
6	Sierra College Boulevard & Taylor Road	**#256**	**#580**	161	44	337	36	**#250**	#282	71	**#292**	296	-
7	Sierra College Boulevard & Brace Road	-	253	16	#124	241	-	-	-	#29	**#160**	-	33
8	Sierra College Boulevard & Granite Drive	**470**	**#1250**	33	114	**#1520**	89	**282**	57	53	**175**	59	-
9	Sierra College Boulevard & I-80 WB Ramps	**m#753**	m514	m22	-	**#1101**	**182**	#429	-	185	273	#466	340
10	Sierra College Boulevard & I-80 EB Ramps	-	464	70	m218	m475	m179	437	194	129	**#382**	-	**#823**
11	Sierra College Boulevard & Schriber Way	68	272	-	-	**#683**	23	112	-	-	-	94	73
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	8	383	17	#121	434	-	13	-	-	56	-	-
13	Sierra College Boulevard & Stadium Dwy	30	295	-	-	173	-	41	-	31	-	-	-
14	Sierra College Boulevard & Rocklin Road	**248**	**#934**	-	**#397**	347	117	**#626**	221	201	#134	#408	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#175	#654	-	57	399	-	-	94	50	-	127	-
16	Pacific Street & Rocklin Road	83	**431**	**#802**	**#387**	372	-	78	112	-	**#738**	**#763**	204
17	Granite Drive & Rocklin Road	76	45	-	278	275	66	**#378**	373	-	61	#637	**#379**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	54	#338	-	-	#491	143	**#624**	332	-
19	I-80 Eastbound Ramps & Rocklin Road	**#590**	#572	308	-	-	-	**#346**	188	-	-	**#832**	-
20	Aguilar Road & Rocklin Road	78	-	-	-	-	-	58	330	-	32	371	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	5	-	-	-
22	Dominguez Road & Granite Driive	13	-	-	-	-	-	58	-	13	-	-	-
23	El Don Drive & Rocklin Road	106	22	-	-	#284	73	#252	#499	-	41	#499	-
24	Sierra College Boulevard & Project Driveway	-	#339	41	#147	338	-	-	-	-	111	-	40
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	725	38	-	-	-	-	105	163	35	88	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	18	-	-	-	-	-	123	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	8	-	-	148	3
29	Taylor Road & English Colony Way-Rock Springs Road	25	133	-	3	45	15	-	30	20	-	23	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	13	-	-	-	-	-	120	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	10	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dro	-	-	-	-	-	-	-	-	-	-	13	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	55	-	8
35	Taylor Road & Rippey Road	3	-	-	-	-	-	8	-	-	-	-	-
36	Taylor Road & Webb Street	40	-	-	-	-	-	-	-	70	-	23	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	-	0	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#360**	263	32	#45	169	-	**66**	60	46	**185**	83	-
2	Taylor Road & Horseshoe Bar Road	26	**#507**	18	**#289**	**416**	-	-	33	-	-	94	99
3	Horseshoe Bar Road & I-80 Westbound Ramp	**138**	131	-	48	124	64	-	#163	6	78	85	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	5	-	-	-	-	-	185	-
5	Barton Road & Brace Road	-	75	-	-	-	-	-	-	-	-	8	-
6	Sierra College Boulevard & Taylor Road	**#269**	311	128	46	#354	30	**#167**	177	71	**#303**	153	-
7	Sierra College Boulevard & Brace Road	-	195	15	#109	263	-	-	-	-	**#171**	-	10
8	Sierra College Boulevard & Granite Drive	**366**	**#968**	51	111	**#1394**	96	**221**	52	50	**175**	54	-
9	Sierra College Boulevard & I-80 WB Ramps	**m#1011**	m311	m18	-	**#1063**	**241**	#509	-	**#636**	280	#507	369
10	Sierra College Boulevard & I-80 EB Ramps	-	372	66	**m280**	m412	m105	381	233	126	**#409**	-	**#886**
11	Sierra College Boulevard & Schriber Way	**#124**	226	-	-	**#633**	52	128	-	-	-	95	72
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	5	267	30	#137	375	-	9	-	-	50	5	31
13	Sierra College Boulevard & Stadium Dwy	18	227	-	-	170	-	15	-	15	-	-	-
14	Sierra College Boulevard & Rocklin Road	171	**#673**	-	**#290**	279	58	**#394**	123	106	#176	#184	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#107	236	-	40	#260	21	-	59	32	-	45	6
16	Pacific Street & Rocklin Road	30	245	**#312**	**#309**	209	-	65	63	-	**#320**	#326	53
17	Granite Drive & Rocklin Road	64	42	-	214	211	58	**#381**	275	-	40	306	**160**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	42	122	-	-	#364	80	**#445**	171	-
19	I-80 Eastbound Ramps & Rocklin Road	#316	#293	149	-	-	-	#168	102	-	-	#367	-
20	Aguilar Road & Rocklin Road	62	-	-	-	-	-	50	222	-	20	217	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	13	-	-	-	-	-	48	-	13	-	-	-
23	El Don Drive & Rocklin Road	80	17	-	-	#56	-	48	#423	-	40	#396	-
24	Sierra College Boulevard & Project Driveway	-	#270	104	**#195**	317	-	-	-	-	139	-	47
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	368	**48**	-	5	-	-	88	215	330	65	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	-	-	5	-	-	-	-	-	45	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	-	-	-	-	5	-	-	143	-
29	Taylor Road & English Colony Way-Rock Springs Road	53	218	-	3	140	20	-	65	**63**	-	45	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	-	-	10	-	-	-	-	-	60	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	-	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dro	-	-	-	3	-	-	-	-	-	-	63	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	55	-	8
35	Taylor Road & Rippey Road	8	-	-	-	-	-	13	-	-	-	-	-
36	Taylor Road & Webb Street	35	-	-	-	-	-	-	-	263	-	-	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	-	-	-

Notes:

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m - Volume for 95th percentile queue is metered by upstream signal.

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Cumulative-Short TermP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	0.87%	0.76%	1.03%	0.00%	0.93%	0.00%	0.00%	0.00%	0.84%	0.70%	0.00%	0.00%
2	0.00%	1.69%	0.00%	0.00%	1.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	2.56%	-	0.00%	-	-	-	-	0.59%	2.86%	0.00%	0.86%	-
6	4.35%	1.58%	3.27%	0.00%	0.73%	0.00%	0.00%	0.00%	6.36%	2.80%	0.00%	0.00%
7	-	2.59%	0.00%	0.00%	1.79%	0.00%	-	-	0.00%	0.00%	-	2.06%
8	0.00%	14.37%	0.00%	0.00%	8.85%	3.13%	2.75%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	6.22%	0.00%	-	7.03%	0.00%	0.00%	-	0.00%	0.00%	0.00%	18.79%
10	-	0.97%	0.00%	0.00%	0.80%	17.09%	10.95%	0.00%	0.00%	0.00%	-	0.00%
11	0.00%	1.14%	0.00%	-	0.68%	0.00%	0.00%	-	0.00%	0.00%	-	0.00%
12	-	1.07%	0.00%	0.00%	0.65%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%
13	0.00%	1.10%	-	-	0.71%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	1.00%	0.00%	0.68%	0.84%	0.81%	1.54%	0.00%	0.00%	0.00%	0.00%	0.61%
15	0.00%	1.73%	0.00%	0.00%	1.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	0.80%	0.34%	0.00%	0.65%	17.39%	13.79%	0.00%	0.00%	0.37%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	2.05%	1.91%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	-	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	3.85%	-	-	-	0.00%	0.00%	0.00%	9.09%	0.00%	-
21	0.00%	2.28%	-	-	1.50%	0.00%	-	-	-	-	-	-
22	0.00%	1.75%	-	-	1.08%	0.00%	0.00%	-	0.00%	-	-	-
23	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.11%	0.00%	7.69%	0.16%	0.00%
24	-	-4.40%	100.00%	100.00%	-2.46%	-	-	-	-	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.00%	-	-	0.90%	-
26	0.98%	-	1.27%	0.00%	-	0.00%	-	0.00%	0.56%	0.63%	0.00%	-
27	-	1.41%	20.00%	0.00%	0.61%	-	-	-	-	25.00%	-	0.00%
28	0.00%	1.41%	2.38%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	0.00%
29	1.22%	0.57%	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.55%	0.00%	0.00%	0.00%
30	0.00%	0.68%	-	-	0.34%	-	-	-	0.00%	-	-	-
31	-	1.03%	0.79%	0.00%	0.56%	-	-	-	-	1.16%	-	0.00%
32	-	1.09%	0.00%	0.00%	0.57%	-	-	-	-	0.00%	-	0.00%
33	0.00%	1.05%	0.00%	0.00%	0.75%	0.00%	-	-	0.00%	0.00%	-	0.00%
34	-	0.84%	0.00%	0.00%	0.70%	-	-	-	-	0.00%	-	0.00%
35	1.75%	0.31%	-	-	0.43%	-	0.00%	-	2.50%	-	-	-
36	0.70%	0.80%	0.00%	0.00%	0.94%	0.00%	-	-	0.53%	0.00%	0.00%	0.00%
37	-	-	-	-	-	-	-	0.00%	-	-	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Short TermP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	1.68%	2.39%	2.17%	0.00%	2.75%	0.00%	0.00%	0.00%	1.43%	2.60%	0.00%	0.00%
2	0.00%	3.59%	0.00%	0.00%	3.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	3.28%	-	0.00%	-	-	-	-	2.13%	4.35%	0.00%	1.86%	-
6	13.04%	1.75%	5.25%	0.00%	2.47%	0.00%	0.00%	0.00%	10.99%	4.92%	0.00%	0.00%
7	-	3.79%	0.00%	6.09%	4.23%	-	-	-	0.00%	0.00%	-	2.42%
8	0.00%	15.40%	0.00%	0.00%	17.18%	7.14%	4.57%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	8.11%	0.00%	-	14.99%	0.00%	0.00%	-	0.00%	0.00%	0.00%	31.67%
10	-	1.57%	0.00%	0.00%	2.43%	25.93%	14.29%	0.00%	0.00%	0.00%	-	0.00%
11	0.00%	1.63%	0.00%	-	2.16%	0.00%	0.00%	-	0.00%	0.00%	-	0.00%
12	0.00%	1.49%	0.00%	0.00%	2.09%	0.00%	0.00%	-	0.00%	0.00%	-	0.00%
13	0.00%	1.59%	-	-	2.09%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	1.42%	0.00%	1.87%	1.97%	2.09%	1.55%	0.00%	0.00%	0.00%	0.00%	1.79%
15	0.00%	3.07%	0.00%	0.00%	3.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	1.22%	0.81%	0.00%	1.49%	29.73%	23.81%	0.00%	0.00%	0.74%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	3.11%	3.36%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	9.52%	-	-	-	0.00%	0.00%	0.00%	9.09%	0.00%	-
21	0.00%	3.40%	-	-	3.36%	0.00%	-	-	0.00%	-	-	-
22	0.00%	2.13%	-	-	2.80%	0.00%	0.00%	-	0.00%	-	-	-
23	0.00%	0.00%	14.81%	0.00%	0.00%	0.00%	0.00%	0.21%	0.00%	18.18%	0.21%	0.00%
24	-	-5.55%	100.00%	100.00%	-5.57%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	0.93%	-
26	1.36%	-	2.34%	-	-	-	0.00%	0.00%	2.09%	3.03%	0.00%	-
27	-	1.42%	11.11%	0.00%	2.24%	-	-	-	-	12.50%	-	0.00%
28	0.00%	1.59%	2.27%	0.00%	2.48%	0.00%	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%
29	1.83%	1.61%	0.00%	0.00%	2.35%	0.00%	0.00%	0.00%	2.02%	0.00%	0.00%	0.00%
30	0.00%	1.29%	-	-	1.79%	0.00%	-	-	0.00%	-	-	-
31	-	2.01%	3.39%	0.00%	2.82%	-	-	-	-	2.63%	-	0.00%
32	-	2.18%	0.00%	0.00%	2.11%	-	-	-	-	0.00%	-	0.00%
33	-	2.19%	0.00%	0.00%	1.89%	-	-	-	-	0.00%	-	0.00%
34	-	2.17%	0.00%	0.00%	1.89%	-	-	-	-	0.00%	-	0.00%
35	6.06%	1.61%	-	-	1.74%	0.00%	0.00%	-	5.13%	-	-	-
36	1.75%	2.18%	0.00%	0.00%	2.14%	0.00%	-	-	2.68%	0.00%	0.00%	0.00%
37	100.00%	-	100.00%	-	-	-	-	1.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Short TermP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	3.93%	5.64%	4.79%	0.00%	5.60%	0.00%	0.00%	0.00%	4.17%	3.90%	0.00%	0.00%
2	0.00%	7.60%	0.00%	0.00%	6.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	3.33%	0.00%	0.00%	0.00%	-	0.00%	-	5.88%	2.99%	0.00%	6.11%	-
6	21.67%	4.71%	8.85%	0.00%	4.87%	0.00%	0.00%	0.00%	23.16%	8.66%	0.00%	0.00%
7	-	8.22%	0.00%	14.85%	7.97%	-	-	-	0.00%	0.00%	-	8.33%
8	0.00%	23.48%	0.00%	0.00%	21.13%	11.89%	11.32%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	12.99%	0.00%	-	19.26%	0.00%	0.00%	-	0.00%	0.00%	0.00%	44.29%
10	-	4.21%	0.00%	0.00%	4.74%	36.77%	16.30%	0.00%	0.00%	0.00%	-	0.00%
11	0.00%	4.13%	0.00%	-	4.15%	0.00%	0.00%	-	0.00%	0.00%	-	0.00%
12	0.00%	3.74%	0.00%	0.00%	4.05%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%
13	0.00%	3.54%	-	-	3.80%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	3.36%	0.00%	3.57%	3.72%	4.33%	3.85%	0.00%	0.00%	0.00%	0.00%	3.72%
15	0.00%	9.49%	0.00%	0.00%	7.46%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	3.27%	2.11%	0.00%	3.62%	44.44%	42.00%	0.00%	0.00%	1.88%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	6.23%	6.45%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	20.00%	-	-	-	0.00%	0.00%	0.00%	25.00%	0.00%	-
21	0.00%	7.29%	-	-	6.65%	-	-	-	-	-	-	-
22	0.00%	3.86%	-	-	4.47%	0.00%	0.00%	-	0.00%	-	-	-
23	0.00%	0.00%	34.78%	0.00%	0.00%	0.00%	0.00%	0.43%	0.00%	26.92%	0.41%	0.00%
24	-	-8.41%	100.00%	100.00%	-7.16%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	2.09%	-
26	4.21%	0.00%	5.03%	0.00%	0.00%	0.00%	0.00%	0.00%	4.78%	2.26%	0.00%	0.00%
27	-	4.01%	20.00%	0.00%	4.63%	-	-	-	-	16.00%	-	0.00%
28	0.00%	4.43%	7.41%	0.00%	4.90%	0.00%	0.00%	0.00%	0.00%	5.48%	0.00%	0.00%
29	3.77%	4.42%	0.00%	0.00%	4.42%	0.00%	0.00%	0.00%	3.08%	0.00%	0.00%	0.00%
30	0.00%	3.14%	-	-	3.43%	0.00%	0.00%	-	0.00%	-	-	-
31	-	4.44%	6.06%	0.00%	5.06%	-	-	-	-	5.13%	-	0.00%
32	-	4.34%	0.00%	-	3.83%	-	-	-	-	0.00%	-	0.00%
33	0.00%	4.46%	0.00%	0.00%	3.99%	-	-	-	0.00%	0.00%	-	0.00%
34	-	4.21%	0.00%	0.00%	3.70%	-	-	-	-	0.00%	-	0.00%
35	9.09%	3.77%	-	-	4.13%	0.00%	-	-	12.12%	-	-	-
36	5.56%	5.22%	0.00%	0.00%	4.77%	0.00%	-	-	4.35%	0.00%	0.00%	0.00%
37	100.00%	-	100.00%	-	-	-	-	2.18%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	203	146	274	164	300	264	456	111	46	502
v/c Ratio	0.65	0.47	0.57	0.45	0.77	0.78	0.69	0.18	0.70	0.75
Control Delay	43.7	38.0	9.3	34.4	41.9	53.7	31.9	5.9	95.2	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	38.0	9.3	34.4	41.9	53.7	31.9	5.9	95.2	39.1
Queue Length 50th (ft)	100	70	0	76	130	135	202	0	25	121
Queue Length 95th (ft)	187	139	58	147	238	#335	385	36	#102	210
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	603	594	678	597	609	339	767	685	66	844
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.25	0.40	0.27	0.49	0.78	0.59	0.16	0.70	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Taylor Rd & Horseshoe Bar Rd

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	66	62	527	2	445	59	460	423
v/c Ratio	0.25	0.23	0.67	0.01	0.69	0.10	0.72	0.29
Control Delay	25.1	28.4	12.8	31.5	25.2	0.6	26.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	28.4	12.8	31.5	25.2	0.6	26.1	4.4
Queue Length 50th (ft)	20	23	85	1	157	0	157	40
Queue Length 95th (ft)	55	58	180	7	#284	3	#327	141
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	640	660	974	200	904	800	877	1474
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.54	0.01	0.49	0.07	0.52	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	99	133	55	86	182	631	20	241	398
v/c Ratio	0.70	0.21	0.30	0.43	0.64	0.48	0.15	0.60	0.64
Control Delay	59.0	5.9	39.8	35.3	42.9	19.5	41.4	34.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	5.9	39.8	35.3	42.9	19.5	41.4	34.7	9.7
Queue Length 50th (ft)	46	0	27	32	89	105	10	104	12
Queue Length 95th (ft)	#155	42	66	80	162	194	34	201	98
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	141	641	452	453	479	1710	162	560	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.21	0.12	0.19	0.38	0.37	0.12	0.43	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Sierra College Blvd & Taylor Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	214	117	266	199	22	171	470	228	30	1015	184
v/c Ratio	0.75	0.58	0.25	0.83	0.54	0.05	0.83	0.30	0.22	0.25	0.86	0.21
Control Delay	69.2	36.1	1.8	60.8	34.9	0.2	69.4	16.5	2.2	43.9	36.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.2	36.1	1.8	60.8	34.9	0.2	69.4	16.5	2.2	43.9	36.1	2.9
Queue Length 50th (ft)	59	101	0	71	93	0	88	67	0	15	255	0
Queue Length 95th (ft)	#159	168	6	#150	157	0	#215	144	34	44	#418	35
Internal Link Dist (ft)		429			1915			582			306	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	153	516	565	321	508	580	206	1586	1047	122	1177	875
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.41	0.21	0.83	0.39	0.04	0.83	0.30	0.22	0.25	0.86	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	111	134	103	782	104	150	1248	1
v/c Ratio	0.32	0.55	0.20	0.37	0.10	0.67	0.58	0.00
Control Delay	2.5	31.5	2.8	14.0	1.8	38.0	9.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	31.5	2.8	14.0	1.8	38.0	9.7	0.0
Queue Length 50th (ft)	0	38	0	69	0	42	130	0
Queue Length 95th (ft)	0	#97	17	101	15	#107	190	0
Internal Link Dist (ft)				218			582	
Turn Bay Length (ft)		100			200	170		
Base Capacity (vph)	344	250	582	2133	1034	264	2151	1029
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.54	0.18	0.37	0.10	0.57	0.58	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	114	24	251	155	43	29	276	848	118	93	1366	100
v/c Ratio	0.49	0.21	0.64	0.66	0.29	0.14	0.77	0.47	0.13	0.53	0.90	0.14
Control Delay	57.4	60.6	14.8	62.4	58.2	1.4	59.3	19.2	4.4	63.4	42.0	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	1.3	0.0
Total Delay	57.4	60.6	14.8	62.4	58.2	1.4	59.3	19.4	4.4	63.4	43.2	8.5
Queue Length 50th (ft)	81	17	0	110	30	0	194	194	3	66	483	8
Queue Length 95th (ft)	162	52	47	205	76	0	325	336	39	138	#878	51
Internal Link Dist (ft)		707			532			403			593	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	426	452	821	426	448	457	663	2189	1052	286	1516	722
Starvation Cap Reductn	0	0	0	0	0	0	8	596	0	0	47	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.05	0.31	0.36	0.10	0.06	0.42	0.53	0.11	0.33	0.93	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	22	98	695	227	214	119	971	216	1813	69
v/c Ratio	0.27	0.38	0.85	0.64	0.57	0.91	0.30	0.21	0.71	0.07
Control Delay	63.8	18.8	53.5	36.6	23.4	105.5	5.8	0.6	22.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0
Total Delay	63.8	18.8	53.5	36.6	23.4	105.5	5.8	0.6	25.4	0.5
Queue Length 50th (ft)	17	14	265	111	57	94	54	0	365	0
Queue Length 95th (ft)	45	63	313	196	140	m#202	83	5	477	4
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	91	258	1419	559	557	133	3259	1023	2553	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	602	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.38	0.49	0.41	0.38	0.89	0.30	0.21	0.93	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	483	120	233	53	128	1179	38	224	1444	410
v/c Ratio	0.69	0.26	0.76	0.46	0.49	0.37	0.04	0.65	0.59	0.35
Control Delay	48.1	47.9	39.0	67.3	17.8	13.6	0.1	50.1	8.0	1.0
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Total Delay	48.1	47.9	39.1	67.3	17.8	13.7	0.1	50.1	8.0	1.0
Queue Length 50th (ft)	181	45	82	41	11	90	0	86	150	0
Queue Length 95th (ft)	200	67	152	80	60	231	m0	105	303	11
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	750	1226	610	117	293	3194	917	421	2464	1156
Starvation Cap Reductn	0	0	0	0	0	800	0	0	0	0
Spillback Cap Reductn	0	0	50	0	0	0	0	0	131	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.10	0.42	0.45	0.44	0.49	0.04	0.53	0.62	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

11: Sierra College Blvd & Schriber Way

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	8	5	148	217	8	1155	1802	14
v/c Ratio	0.09	0.02	0.65	0.61	0.09	0.25	0.71	0.01
Control Delay	55.9	0.2	62.4	13.7	55.9	5.2	8.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	0.2	62.4	13.7	55.9	5.2	8.9	0.0
Queue Length 50th (ft)	6	0	111	0	6	50	81	0
Queue Length 95th (ft)	23	0	171	45	23	105	573	m0
Internal Link Dist (ft)		343	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	265	353	280	385	90	4601	2545	1196
Starvation Cap Reductn	0	0	0	0	0	0	18	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01	0.53	0.56	0.09	0.25	0.71	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	1	48	1	10	1166	31	50	1928	4
v/c Ratio	0.05	0.00	0.26	0.01	0.05	0.33	0.03	0.40	0.66	0.00
Control Delay	45.5	0.0	46.7	42.0	0.5	7.4	0.0	49.8	5.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Total Delay	45.5	0.0	46.7	42.0	0.5	7.4	0.0	49.8	6.6	0.0
Queue Length 50th (ft)	2	0	13	1	0	91	0	27	163	0
Queue Length 95th (ft)	10	0	30	6	0	154	0	60	322	0
Internal Link Dist (ft)		226		372		97			363	
Turn Bay Length (ft)	130		265		150		45	220		200
Base Capacity (vph)	63	661	186	702	557	3816	1182	174	2958	1026
Starvation Cap Reductn	0	0	0	0	0	0	0	0	695	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.00	0.26	0.00	0.02	0.31	0.03	0.29	0.85	0.00

Intersection Summary

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	29	11	96	1192	2243
v/c Ratio	0.09	0.07	0.53	0.39	0.63
Control Delay	28.1	16.6	40.9	2.1	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	16.6	40.9	2.1	7.6
Queue Length 50th (ft)	5	0	35	0	108
Queue Length 95th (ft)	14	11	68	76	205
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1015	499	183	3033	3565
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.02	0.52	0.39	0.63

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	157	369	357	151	615	518	948	178	1006	296
v/c Ratio	0.74	0.35	0.60	1.53	0.75	1.93	0.89	0.91	0.56	0.40
Control Delay	61.2	25.9	15.7	311.2	34.5	460.6	41.8	87.4	25.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	25.9	15.7	311.2	34.5	460.6	41.8	87.4	25.2	4.5
Queue Length 50th (ft)	90	87	70	~126	153	~246	275	105	172	0
Queue Length 95th (ft)	#162	114	132	#228	191	#321	#340	#211	201	39
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	226	1212	659	99	948	268	1075	196	1819	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.30	0.54	1.53	0.65	1.93	0.88	0.91	0.55	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	79	187	152	56	137	532	40	441	52
v/c Ratio	0.34	0.44	0.50	0.14	0.60	0.52	0.27	0.60	0.08
Control Delay	22.4	7.2	25.1	2.3	38.9	13.6	30.0	17.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	7.2	25.1	2.3	38.9	13.6	30.0	17.6	1.8
Queue Length 50th (ft)	22	0	44	0	43	80	12	108	0
Queue Length 95th (ft)	55	41	92	10	#130	#308	40	218	10
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	567	758	718	840	230	1033	146	845	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.21	0.07	0.60	0.52	0.27	0.52	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	32	213	385	399	156	50	556	651	327	709
v/c Ratio	0.25	0.59	0.85	0.86	0.29	0.43	0.61	0.91	0.86	0.48
Control Delay	56.7	39.3	60.3	61.3	8.8	66.6	41.6	33.1	68.5	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	39.3	60.3	61.3	8.8	66.6	41.6	33.1	68.5	26.1
Queue Length 50th (ft)	24	52	306	318	7	38	197	203	252	209
Queue Length 95th (ft)	57	93	#511	#532	61	82	266	#458	#437	281
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	363	851	455	464	532	134	1003	749	380	1474
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.25	0.85	0.86	0.29	0.37	0.55	0.87	0.86	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Granite Dr & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	180	1137	20	913	641	14	25	213	209	168
v/c Ratio	0.73	0.67	0.20	0.79	0.79	0.08	0.16	0.64	0.62	0.37
Control Delay	55.0	21.9	45.8	33.5	16.6	39.8	33.5	39.7	38.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	21.9	45.8	33.5	16.6	39.8	33.5	39.7	38.8	6.6
Queue Length 50th (ft)	94	215	11	235	77	7	9	111	108	0
Queue Length 95th (ft)	#199	391	34	#342	#242	26	34	177	174	39
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	259	1701	102	1163	810	169	157	596	602	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.67	0.20	0.79	0.79	0.08	0.16	0.36	0.35	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1000	582	462	1369	52	247
v/c Ratio	0.75	0.62	0.85	0.53	0.20	0.78
Control Delay	30.7	5.6	30.9	10.0	32.2	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	5.6	30.9	10.0	32.2	38.7
Queue Length 50th (ft)	267	0	226	212	26	85
Queue Length 95th (ft)	#400	74	m280	m334	53	150
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1333	933	549	2607	443	466
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.62	0.84	0.53	0.12	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

19: I-80 EB Ramps & Rocklin Rd

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	226	814	1149	579	555	540
v/c Ratio	0.90	0.43	0.92	0.95	0.87	0.84
Control Delay	81.7	12.3	40.4	56.1	36.3	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.7	12.3	40.4	56.1	36.3	32.5
Queue Length 50th (ft)	141	66	323	331	246	221
Queue Length 95th (ft)	m#219	143	#458	#555	#468	#422
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	255	1903	1254	608	636	645
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.43	0.92	0.95	0.87	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

20: Aguilar Rd & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	56	1784	13	1026	161	30
v/c Ratio	0.31	0.76	0.11	0.49	0.53	0.10
Control Delay	37.4	12.2	36.4	10.4	33.7	1.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	37.4	12.5	36.4	10.4	33.7	1.0
Queue Length 50th (ft)	20	199	5	138	57	0
Queue Length 95th (ft)	64	489	24	213	131	2
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	186	2594	124	2521	551	488
Starvation Cap Reductn	0	273	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.77	0.10	0.41	0.29	0.06

Intersection Summary

23: El Don Drive & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	570	1048	14	838	175	37	44	41
v/c Ratio	0.89	0.46	0.14	0.88	0.60	0.12	0.45	0.20
Control Delay	49.4	12.1	50.6	47.3	47.7	19.5	42.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	12.1	50.6	47.3	47.7	19.5	42.1	2.1
Queue Length 50th (ft)	339	146	9	264	107	8	11	0
Queue Length 95th (ft)	#669	373	30	#468	173	35	#61	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	642	2323	103	953	535	526	97	210
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.45	0.14	0.88	0.33	0.07	0.45	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	59	864	168	59	1461
v/c Ratio	0.32	0.20	0.31	0.13	0.29	0.61
Control Delay	20.5	8.0	8.2	0.8	24.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	8.0	8.2	0.8	24.3	6.4
Queue Length 50th (ft)	22	0	57	0	16	97
Queue Length 95th (ft)	43	24	91	10	45	179
Internal Link Dist (ft)	356		593			350
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1176	581	2789	1479	212	2391
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.10	0.31	0.11	0.28	0.61

Intersection Summary

1: Taylor Rd & King Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	71	137	471	173	173	402	471	207	54	506
v/c Ratio	0.29	0.53	0.75	0.65	0.62	0.81	0.56	0.26	0.46	0.75
Control Delay	38.0	43.4	12.1	48.4	42.7	45.9	23.5	3.9	57.0	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	43.4	12.1	48.4	42.7	45.9	23.5	3.9	57.0	40.9
Queue Length 50th (ft)	35	71	0	90	80	203	188	0	29	130
Queue Length 95th (ft)	80	138	87	174	162	#469	374	45	#86	224
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	562	597	822	568	573	498	881	818	124	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.23	0.57	0.30	0.30	0.81	0.53	0.25	0.44	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	58	91	479	23	712	85	413	764
v/c Ratio	0.23	0.43	0.70	0.18	0.86	0.12	0.81	0.54
Control Delay	26.4	39.4	19.9	41.4	33.5	2.5	42.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	39.4	19.9	41.4	33.5	2.5	42.8	8.6
Queue Length 50th (ft)	19	44	140	11	320	0	199	115
Queue Length 95th (ft)	52	89	236	37	#590	18	#384	369
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	445	386	732	137	935	808	565	1420
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.24	0.65	0.17	0.76	0.11	0.73	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	115	81	112	101	112	606	49	203	354
v/c Ratio	0.77	0.13	0.50	0.38	0.52	0.59	0.33	0.48	0.56
Control Delay	64.2	2.6	41.5	19.9	42.2	23.9	42.6	30.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	2.6	41.5	19.9	42.2	23.9	42.6	30.5	7.0
Queue Length 50th (ft)	50	0	51	16	51	123	22	83	0
Queue Length 95th (ft)	#172	17	110	64	110	188	63	163	66
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	149	647	455	480	469	1662	175	570	733
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.13	0.25	0.21	0.24	0.36	0.28	0.36	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Sierra College Blvd & Taylor Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	212	317	204	548	340	49	181	1283	513	26	865	181
v/c Ratio	0.83	0.77	0.42	1.00	0.75	0.10	1.01	0.87	0.47	0.31	0.81	0.21
Control Delay	68.2	49.1	10.1	79.8	45.6	0.4	117.0	35.2	6.7	55.5	38.7	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	49.1	10.1	79.8	45.6	0.4	117.0	35.2	6.7	55.5	38.7	3.2
Queue Length 50th (ft)	133	187	14	~193	199	0	~126	360	60	16	266	3
Queue Length 95th (ft)	#250	#282	71	#292	296	0	#256	#580	161	44	337	36
Internal Link Dist (ft)		429			1915			582			355	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	267	452	520	550	484	524	179	1482	1087	85	1103	865
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.70	0.39	1.00	0.70	0.09	1.01	0.87	0.47	0.31	0.78	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	207	129	1706	196	120	1380
v/c Ratio	0.54	0.72	0.26	0.80	0.17	0.80	0.68
Control Delay	10.3	40.4	5.3	19.3	1.1	67.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	40.4	5.3	19.3	1.1	67.6	11.5
Queue Length 50th (ft)	0	72	0	195	0	44	172
Queue Length 95th (ft)	#29	#160	33	253	16	#124	241
Internal Link Dist (ft)				222			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	272	303	557	2122	1166	154	2028
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.68	0.23	0.80	0.17	0.78	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	28	391	114	26	35	381	1969	73	65	1864	134
v/c Ratio	0.68	0.15	0.62	0.60	0.25	0.20	0.83	0.93	0.08	0.46	1.35	0.20
Control Delay	64.5	58.5	10.0	71.2	70.0	2.7	62.4	35.8	5.7	71.8	195.2	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5	45.5	0.0	0.0	0.1	0.0
Total Delay	64.5	58.5	10.0	71.2	70.0	2.7	62.9	81.3	5.7	71.8	195.3	14.5
Queue Length 50th (ft)	172	22	0	94	22	0	305	817	6	54	~1112	28
Queue Length 95th (ft)	282	57	53	175	59	0	470	#1250	33	114	#1520	89
Internal Link Dist (ft)		707			573			403			593	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	423	428	939	410	428	425	604	2132	955	276	1381	665
Starvation Cap Reductn	0	0	0	0	0	0	46	473	0	0	37	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.07	0.42	0.28	0.06	0.08	0.68	1.19	0.08	0.24	1.39	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	213	327	591	340	317	445	1744	417	2136	222
v/c Ratio	1.23	0.59	0.49	0.92	0.80	1.10	0.60	0.38	1.38	0.39
Control Delay	197.4	24.1	39.1	83.5	54.0	122.7	22.9	2.1	213.5	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	197.4	24.1	39.1	83.5	54.0	122.7	22.9	2.1	214.1	26.6
Queue Length 50th (ft)	~256	116	229	324	225	~514	452	5	~1011	103
Queue Length 95th (ft)	#429	185	273	#466	340	m#753	m514	m22	#1101	182
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	173	554	1323	428	447	404	2891	1086	1549	563
Starvation Cap Reductn	0	0	0	0	0	0	0	0	216	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.23	0.59	0.45	0.79	0.71	1.10	0.60	0.38	1.60	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	766	291	159	209	488	1949	186	414	1302	654
v/c Ratio	0.89	0.78	0.62	1.00	1.43	0.65	0.22	0.72	0.55	0.51
Control Delay	66.8	79.5	34.9	127.0	244.2	30.9	6.9	75.2	16.8	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	47.9	0.9	0.0	0.0	0.0
Total Delay	66.8	79.5	34.9	127.0	244.2	78.8	7.8	75.2	16.8	5.2
Queue Length 50th (ft)	374	148	53	208	~595	397	22	212	476	141
Queue Length 95th (ft)	437	194	129	#382	#823	464	70	m218	m475	m179
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	895	1010	516	209	341	3005	846	578	2368	1292
Starvation Cap Reductn	0	0	0	0	0	1283	430	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.29	0.31	1.00	1.43	1.13	0.45	0.72	0.55	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Sierra College Blvd & Schriber Way

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	105	55	82	170	52	2144	1511	98
v/c Ratio	0.53	0.13	0.46	0.58	0.34	0.52	0.79	0.11
Control Delay	50.8	0.7	50.2	18.0	48.6	10.2	24.8	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	25.0	0.0
Total Delay	50.8	0.7	50.2	18.0	48.6	10.6	49.8	2.8
Queue Length 50th (ft)	64	0	50	12	32	184	402	0
Queue Length 95th (ft)	112	0	94	73	68	272	#683	23
Internal Link Dist (ft)		220	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	318	498	324	410	151	4130	1924	913
Starvation Cap Reductn	0	0	0	0	0	1244	475	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.11	0.25	0.41	0.34	0.74	1.04	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	1	116	76	2	2114	92	87	1562	1
v/c Ratio	0.04	0.00	0.36	0.23	0.02	0.69	0.09	0.66	0.61	0.00
Control Delay	36.0	0.0	35.8	1.7	35.5	12.8	1.8	60.8	8.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Total Delay	36.0	0.0	35.8	1.7	35.5	12.8	1.8	60.8	9.3	0.0
Queue Length 50th (ft)	2	0	25	0	1	212	0	39	124	0
Queue Length 95th (ft)	13	0	56	0	8	383	17	#121	434	0
Internal Link Dist (ft)		226				97			363	
Turn Bay Length (ft)	130		265	150	75		45	220		200
Base Capacity (vph)	116	730	355	834	116	3061	996	131	2570	1167
Starvation Cap Reductn	0	0	0	0	0	0	0	0	600	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.00	0.33	0.09	0.02	0.69	0.09	0.66	0.79	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	125	78	27	1920	1578
v/c Ratio	0.28	0.28	0.17	0.71	0.45
Control Delay	25.6	9.7	28.4	7.3	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	9.7	28.4	7.3	6.8
Queue Length 50th (ft)	21	0	9	179	67
Queue Length 95th (ft)	41	31	30	295	173
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1107	563	160	2705	3538
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.14	0.17	0.71	0.45

Intersection Summary

14: Sierra College Blvd & Rocklin Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	415	443	442	75	607	437	1517	230	1090	309
v/c Ratio	1.12	0.44	0.65	0.65	1.14	0.76	1.10	1.10	0.62	0.45
Control Delay	132.1	41.4	15.4	87.5	125.4	63.0	94.5	145.4	39.1	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	132.1	41.4	15.4	87.5	125.4	63.0	94.5	145.4	39.1	9.9
Queue Length 50th (ft)	~418	168	78	65	~285	188	~792	~228	296	37
Queue Length 95th (ft)	#626	221	201	#134	#408	248	#934	#397	347	117
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	370	996	685	120	534	610	1381	209	1750	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.44	0.65	0.63	1.14	0.72	1.10	1.10	0.62	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	107	199	149	51	167	847	45	593	40
v/c Ratio	0.43	0.42	0.60	0.13	0.63	0.80	0.32	0.75	0.06
Control Delay	33.1	7.2	38.6	0.7	43.7	21.6	42.9	25.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	7.2	38.6	0.7	43.7	21.6	42.9	25.4	0.2
Queue Length 50th (ft)	47	0	68	0	78	310	22	220	0
Queue Length 95th (ft)	94	50	127	0	#175	#654	57	399	0
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	456	709	462	636	301	1161	142	974	775
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.28	0.32	0.08	0.55	0.73	0.32	0.61	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	45	173	510	524	404	46	873	789	218	826
v/c Ratio	0.30	0.56	0.99	1.01	0.60	0.43	0.69	1.02	1.08	0.55
Control Delay	62.0	62.3	84.5	88.1	16.1	73.5	40.4	62.0	140.8	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	62.3	84.5	88.1	16.1	73.5	40.4	62.0	140.8	31.4
Queue Length 50th (ft)	37	72	464	~486	86	39	338	~528	~210	288
Queue Length 95th (ft)	78	112	#738	#763	204	83	431	#802	#387	372
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	363	721	514	519	676	121	1258	775	202	1496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.24	0.99	1.01	0.60	0.38	0.69	1.02	1.08	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Granite Dr & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	279	999	38	1217	545	51	31	288	285	301
v/c Ratio	0.96	0.58	0.35	0.99	0.79	0.41	0.23	0.72	0.71	0.50
Control Delay	88.3	22.7	57.3	59.5	24.4	58.6	39.5	46.8	46.0	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.3	22.7	57.3	59.5	24.4	58.6	39.5	46.8	46.0	6.9
Queue Length 50th (ft)	185	264	24	~421	159	33	13	183	180	3
Queue Length 95th (ft)	#378	373	61	#637	#379	76	45	278	275	66
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	291	1731	114	1224	691	123	133	526	530	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.58	0.33	0.99	0.79	0.41	0.23	0.55	0.54	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: I-80 WB Ramps & Rocklin Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1029	557	607	1541	48	344
v/c Ratio	1.01	0.70	0.97	0.64	0.13	0.91
Control Delay	66.3	10.0	63.4	10.2	31.7	62.5
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	66.3	10.0	63.4	10.6	31.7	62.5
Queue Length 50th (ft)	~348	29	~400	266	24	182
Queue Length 95th (ft)	#491	143	#624	332	54	#338
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1022	798	625	2414	415	403
Starvation Cap Reductn	0	0	0	367	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.70	0.97	0.75	0.12	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	238	875	1672	447	435	409
v/c Ratio	0.96	0.38	0.98	0.99	0.97	0.75
Control Delay	98.4	10.2	48.1	84.7	75.8	31.3
Queue Delay	0.0	0.0	41.1	0.0	0.0	0.0
Total Delay	98.4	10.2	89.2	84.7	75.8	31.3
Queue Length 50th (ft)	186	151	647	364	337	174
Queue Length 95th (ft)	#346	188	#832	#590	#572	308
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	249	2329	1708	450	447	545
Starvation Cap Reductn	0	0	372	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.38	1.25	0.99	0.97	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

20: Aguilar Rd & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	57	1508	24	1596	95	23
v/c Ratio	0.31	0.60	0.14	0.66	0.37	0.08
Control Delay	34.7	9.0	32.3	11.2	30.8	0.5
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	34.7	9.3	32.3	11.2	30.8	0.5
Queue Length 50th (ft)	23	120	10	239	37	0
Queue Length 95th (ft)	58	330	32	371	78	0
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	186	2496	170	2418	627	608
Starvation Cap Reductn	0	369	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.71	0.14	0.66	0.15	0.04

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	195	1168	24	1058	133	32	237	227
v/c Ratio	0.79	0.68	0.21	0.87	0.44	0.11	0.96	0.58
Control Delay	58.1	20.5	43.1	34.9	33.2	11.3	75.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	20.5	43.1	34.9	33.2	11.3	75.7	12.2
Queue Length 50th (ft)	90	176	11	236	59	1	81	0
Queue Length 95th (ft)	#252	#499	41	#499	106	22	#284	73
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	248	1727	113	1216	678	634	246	390
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.68	0.21	0.87	0.20	0.05	0.96	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	437	175	1822	421	154	1677
v/c Ratio	0.55	0.35	0.84	0.35	0.71	0.76
Control Delay	23.4	5.7	21.3	2.3	48.2	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	5.7	21.3	2.3	48.2	12.0
Queue Length 50th (ft)	73	0	214	20	56	206
Queue Length 95th (ft)	111	40	#339	41	#147	338
Internal Link Dist (ft)	464		593			346
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1011	589	2168	1297	217	2201
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.30	0.84	0.32	0.71	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: Taylor Rd & King Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	60	356	253	115	346	416	206	27	492
v/c Ratio	0.33	0.29	0.71	0.69	0.31	0.90	0.52	0.27	0.36	0.70
Control Delay	36.3	35.4	12.8	38.1	25.6	60.1	21.2	4.1	53.8	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	35.4	12.8	38.1	25.6	60.1	21.2	4.1	53.8	33.5
Queue Length 50th (ft)	28	25	0	102	37	147	138	0	12	102
Queue Length 95th (ft)	66	60	46	185	83	#360	263	32	#45	169
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	656	654	817	701	689	384	875	809	75	1001
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.44	0.36	0.17	0.90	0.48	0.25	0.36	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2: Taylor Rd & Horseshoe Bar Rd

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	116	295	17	688	98	356	811
v/c Ratio	0.15	0.49	0.44	0.12	0.84	0.14	0.77	0.58
Control Delay	22.5	35.6	10.4	35.1	31.3	2.6	38.8	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	35.6	10.4	35.1	31.3	2.6	38.8	9.4
Queue Length 50th (ft)	11	49	52	7	272	0	147	131
Queue Length 95th (ft)	33	94	99	26	#507	18	#289	416
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	494	422	732	158	916	796	536	1390
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.27	0.40	0.11	0.75	0.12	0.66	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Horseshoe Bar Rd & I-80 WB Ramp

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	112	65	72	106	154	458	34	151	353
v/c Ratio	0.67	0.10	0.37	0.47	0.58	0.38	0.24	0.42	0.59
Control Delay	49.0	1.2	38.4	30.6	39.6	18.4	40.1	30.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	1.2	38.4	30.6	39.6	18.4	40.1	30.8	7.9
Queue Length 50th (ft)	37	0	28	27	60	66	13	58	0
Queue Length 95th (ft)	#163	6	78	85	138	131	48	124	64
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	167	647	471	493	509	1793	166	595	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.10	0.15	0.22	0.30	0.26	0.20	0.25	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Sierra College Blvd & Taylor Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	148	229	188	589	204	26	191	859	553	31	852	131
v/c Ratio	0.69	0.57	0.42	1.04	0.43	0.05	1.16	0.63	0.49	0.29	0.84	0.16
Control Delay	53.7	35.4	11.2	85.0	29.5	0.2	158.7	25.0	4.9	46.8	37.7	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	35.4	11.2	85.0	29.5	0.2	158.7	25.0	4.9	46.8	37.7	3.3
Queue Length 50th (ft)	75	109	18	~175	91	0	~121	171	28	16	220	0
Queue Length 95th (ft)	#167	177	71	#303	153	0	#269	311	128	46	#354	30
Internal Link Dist (ft)		429			1915			582			326	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	232	539	553	567	592	601	164	1373	1135	107	1023	829
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.34	1.04	0.34	0.04	1.16	0.63	0.49	0.29	0.83	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	224	75	1483	190	105	1491
v/c Ratio	0.24	0.76	0.17	0.66	0.15	0.78	0.74
Control Delay	1.9	42.5	2.2	14.4	1.1	66.7	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	42.5	2.2	14.4	1.1	66.7	12.0
Queue Length 50th (ft)	0	72	0	146	0	35	183
Queue Length 95th (ft)	0	#171	10	195	15	#109	263
Internal Link Dist (ft)				222			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	297	295	537	2250	1199	135	2012
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.76	0.14	0.66	0.16	0.78	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	166	24	310	123	25	24	314	1748	102	67	1864	149
v/c Ratio	0.59	0.16	0.60	0.59	0.23	0.13	0.79	0.84	0.11	0.44	1.24	0.21
Control Delay	58.6	57.1	11.2	63.8	63.5	1.5	59.4	27.5	7.5	64.7	146.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	9.7	0.0	0.0	0.1	0.0
Total Delay	58.6	57.1	11.2	63.8	63.5	1.5	59.5	37.2	7.5	64.7	146.1	13.4
Queue Length 50th (ft)	121	17	0	90	19	0	227	575	15	49	~934	30
Queue Length 95th (ft)	221	52	50	175	54	0	366	#968	51	111	#1394	96
Internal Link Dist (ft)		707			491			403			592	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	442	465	940	446	447	477	663	2253	1016	297	1502	716
Starvation Cap Reductn	0	0	0	0	0	0	20	495	0	0	40	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.05	0.33	0.28	0.06	0.05	0.49	0.99	0.10	0.23	1.27	0.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	255	573	628	376	342	594	1420	435	2045	272
v/c Ratio	1.43	0.98	0.50	0.94	0.84	1.38	0.50	0.41	1.46	0.52
Control Delay	268.3	64.0	36.6	81.2	56.2	226.3	18.3	1.7	247.0	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4
Total Delay	268.3	64.0	36.6	81.2	56.2	226.3	18.3	1.7	247.3	33.6
Queue Length 50th (ft)	~327	~371	231	342	242	~782	280	4	~970	147
Queue Length 95th (ft)	#509	#636	280	#507	369	m#1011	m311	m18	#1063	241
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	178	583	1373	453	451	431	2826	1064	1404	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	124	52
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.43	0.98	0.46	0.83	0.76	1.38	0.50	0.41	1.60	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

10: Sierra College Blvd & I-80 EB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	753	373	165	245	556	1444	238	631	1218	580
v/c Ratio	0.72	0.81	0.56	0.97	1.40	0.60	0.31	0.91	0.56	0.49
Control Delay	49.6	75.3	29.7	110.2	231.2	36.9	5.6	80.8	27.8	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	6.2	0.7	0.0	0.0	0.0
Total Delay	49.6	75.3	29.7	110.2	231.2	43.1	6.3	80.8	27.8	9.1
Queue Length 50th (ft)	329	184	52	235	~650	311	7	289	430	119
Queue Length 95th (ft)	381	233	126	#409	#886	372	66	m280	m412	m105
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	1039	1018	521	257	396	2396	770	691	2184	1186
Starvation Cap Reductn	0	0	0	0	0	895	277	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.37	0.32	0.95	1.40	0.96	0.48	0.91	0.56	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

11: Sierra College Blvd & Schriber Way

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	142	79	94	185	84	1670	1405	155
v/c Ratio	0.58	0.16	0.57	0.55	0.47	0.46	0.94	0.21
Control Delay	45.3	0.7	49.1	15.2	49.0	12.3	40.5	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	44.6	0.0
Total Delay	45.3	0.7	49.1	15.2	49.0	12.3	85.1	6.6
Queue Length 50th (ft)	77	0	51	16	45	143	406	10
Queue Length 95th (ft)	128	0	95	72	#124	226	#633	52
Internal Link Dist (ft)		235	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	354	558	240	424	179	3640	1498	743
Starvation Cap Reductn	0	0	0	0	0	0	232	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.14	0.39	0.44	0.47	0.46	1.11	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	3	3	118	1	105	1	1625	130	126	1427	5
v/c Ratio	0.02	0.01	0.32	0.00	0.36	0.01	0.59	0.14	0.62	0.55	0.00
Control Delay	30.3	0.0	29.9	27.0	8.3	30.0	12.6	3.3	44.2	8.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Total Delay	30.3	0.0	29.9	27.0	8.3	30.0	12.6	3.3	44.2	8.8	0.0
Queue Length 50th (ft)	1	0	21	0	0	0	146	2	46	102	0
Queue Length 95th (ft)	9	0	50	5	31	5	267	30	#137	375	0
Internal Link Dist (ft)		226		372			97			363	
Turn Bay Length (ft)	130		265		150	75		45	220		200
Base Capacity (vph)	141	897	390	1041	943	141	2742	917	202	2572	1181
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	419	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.30	0.00	0.11	0.01	0.59	0.14	0.62	0.66	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

13: Sierra College Blvd & Stadium Dwy

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	40	22	16	1811	1631
v/c Ratio	0.10	0.11	0.10	0.63	0.42
Control Delay	21.6	11.2	23.4	5.3	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	11.2	23.4	5.3	4.9
Queue Length 50th (ft)	7	0	6	141	63
Queue Length 95th (ft)	15	15	18	227	170
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1173	571	168	2897	3914
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.04	0.10	0.63	0.42

Intersection Summary

14: Sierra College Blvd & Rocklin Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	325	313	351	99	514	367	1342	204	1064	265
v/c Ratio	0.95	0.31	0.53	0.97	0.82	0.70	1.08	1.00	0.66	0.40
Control Delay	81.5	29.8	9.2	132.6	40.7	49.3	81.5	110.5	33.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.5	29.8	9.2	132.6	40.7	49.3	81.5	110.5	33.6	5.4
Queue Length 50th (ft)	219	85	27	68	122	121	~534	~141	229	0
Queue Length 95th (ft)	#394	123	106	#176	#184	171	#673	#290	279	58
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	341	1056	674	102	664	551	1248	204	1604	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.30	0.52	0.97	0.77	0.67	1.08	1.00	0.66	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

15: Pacific St & Dominguez Rd/Delmar Ave

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	89	107	62	46	118	539	44	575	89
v/c Ratio	0.39	0.30	0.30	0.13	0.61	0.48	0.28	0.63	0.11
Control Delay	24.8	7.4	22.9	1.7	40.6	10.6	28.1	15.7	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	7.4	22.9	1.7	40.6	10.6	28.1	15.7	3.3
Queue Length 50th (ft)	25	0	17	0	36	68	13	132	0
Queue Length 95th (ft)	59	32	45	6	#107	236	40	#260	21
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	658	819	605	836	193	1130	157	919	808
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.13	0.10	0.06	0.61	0.48	0.28	0.63	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

16: Pacific St & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	138	374	378	247	15	683	605	212	636
v/c Ratio	0.30	0.38	0.75	0.75	0.39	0.18	0.66	0.81	1.31	0.43
Control Delay	42.5	36.3	38.5	38.9	5.3	47.4	30.5	19.9	211.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	36.3	38.5	38.9	5.3	47.4	30.5	19.9	211.5	19.9
Queue Length 50th (ft)	29	34	197	201	0	9	176	107	~163	126
Queue Length 95th (ft)	65	63	#320	#326	53	30	245	#312	#309	209
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	591	1165	556	557	683	84	1128	776	162	1468
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.67	0.68	0.36	0.18	0.61	0.78	1.31	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

17: Granite Dr & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	297	795	23	769	536	46	39	254	251	290
v/c Ratio	1.00	0.47	0.21	0.73	0.70	0.32	0.25	0.64	0.63	0.49
Control Delay	92.0	19.2	46.8	33.5	10.8	47.3	27.9	38.0	37.5	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.0	19.2	46.8	33.5	10.8	47.3	27.9	38.0	37.5	6.4
Queue Length 50th (ft)	~173	137	13	200	32	25	9	135	133	0
Queue Length 95th (ft)	#381	275	40	306	160	64	42	214	211	58
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	298	1676	112	1111	785	145	156	625	628	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.47	0.21	0.69	0.68	0.32	0.25	0.41	0.40	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

18: I-80 WB Ramps & Rocklin Rd

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	856	503	538	1163	35	204
v/c Ratio	0.70	0.58	0.84	0.42	0.16	0.73
Control Delay	31.3	5.7	39.1	4.5	34.5	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	5.7	39.1	4.5	34.5	34.3
Queue Length 50th (ft)	221	0	269	88	18	58
Queue Length 95th (ft)	#364	80	#445	171	42	122
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1225	868	644	2743	443	478
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.58	0.84	0.42	0.08	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

19: I-80 EB Ramps & Rocklin Rd

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	184	756	1270	403	390	366
v/c Ratio	0.81	0.36	0.88	0.89	0.85	0.67
Control Delay	56.6	7.5	27.0	47.2	38.0	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	7.5	27.0	47.2	38.0	16.6
Queue Length 50th (ft)	72	72	235	160	132	57
Queue Length 95th (ft)	#168	102	#367	#316	#293	149
Internal Link Dist (ft)		595	411		642	
Turn Bay Length (ft)	170			455		455
Base Capacity (vph)	233	2119	1438	458	464	548
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.36	0.88	0.88	0.84	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

20: Aguilar Rd & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	64	1182	17	1143	99	22
v/c Ratio	0.28	0.49	0.08	0.54	0.33	0.06
Control Delay	25.5	7.3	23.1	10.5	22.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	7.3	23.1	10.5	22.5	0.3
Queue Length 50th (ft)	18	74	5	133	28	0
Queue Length 95th (ft)	50	222	20	217	62	0
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	230	2403	211	2135	806	777
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.49	0.08	0.54	0.12	0.03

Intersection Summary

23: El Don Drive & Rocklin Rd

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	35	1088	27	1044	115	25	57	54
v/c Ratio	0.21	0.56	0.16	0.54	0.32	0.08	0.35	0.17
Control Delay	35.1	16.9	34.5	16.6	23.8	9.6	24.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	16.9	34.5	16.6	23.8	9.6	24.6	1.2
Queue Length 50th (ft)	11	121	8	115	34	0	7	0
Queue Length 95th (ft)	48	#423	40	#396	80	17	#56	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	167	1972	167	1989	1004	858	165	317
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.55	0.16	0.52	0.11	0.03	0.35	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	542	249	1500	574	240	1624
v/c Ratio	0.62	0.42	0.82	0.50	0.78	0.76
Control Delay	24.3	5.5	24.2	4.9	44.9	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	5.5	24.2	4.9	44.9	12.6
Queue Length 50th (ft)	94	0	198	52	91	227
Queue Length 95th (ft)	139	47	#270	104	#195	317
Internal Link Dist (ft)	372		592			347
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	982	630	1820	1184	323	2137
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.40	0.82	0.48	0.74	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option B

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative Long-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative-Short TermP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	108	18	#117	195	-	-	-	16	**#146**	-	30
8	Sierra College Boulevard & Granite Drive	**#347**	183	-	120	**569**	28	#152	46	42	**#244**	68	-
21	Sierra College Boulevard & Driveway South of Brace Road	2	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	87	10	45	164	-	-	-	-	41	-	24
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	276	21	**#172**	265	-	-	-	59	**#322**	-	41
8	Sierra College Boulevard & Granite Drive	**#578**	**481**	-	100	**#1036**	51	**#358**	55	52	**#236**	53	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	5	-	-	-
24	Sierra College Boulevard & Project Driveway	-	307	38	#158	332	-	-	-	-	113	-	43
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	183	16	#130	239	-	-	-	-	**#265**	-	19
8	Sierra College Boulevard & Granite Drive	**#460**	**397**	-	101	**#960**	55	**#265**	54	48	**#303**	54	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	#310	85	#176	311	-	-	-	-	135	-	51
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	2.85%	2.00%	0.00%	1.79%	0.00%	-	-	0.00%	1.56%	-	0.00%
8	0.00%	13.31%	8.13%	0.00%	8.15%	2.11%	1.85%	4.17%	0.00%	6.29%	2.38%	0.00%
21	0.00%	2.75%	-	-	1.64%	0.00%	-	-	-	-	-	-
24	-	0.00%	100.00%	100.00%	0.00%	-	-	-	-	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.83%	-	-	0.90%	-

Notes:

Shading indicates Project impact.

Cumulative Short TermP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	3.96%	1.57%	6.09%	4.23%	-	-	-	0.00%	2.93%	-	0.00%
8	0.00%	14.05%	29.59%	0.00%	15.74%	5.65%	3.59%	7.14%	0.00%	21.90%	7.69%	0.00%
21	0.00%	3.71%	-	-	3.71%	0.00%	-	-	0.00%	-	-	-
24	-	0.00%	100.00%	100.00%	0.00%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	1.00%	100.00%	-	1.84%	-

Notes:

Shading indicates Project impact.

Cumulative Short TermP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	8.60%	3.19%	14.85%	7.97%	-	-	-	0.00%	5.29%	-	0.00%
8	0.00%	20.69%	37.58%	0.00%	18.58%	9.35%	9.03%	14.81%	0.00%	32.18%	14.29%	0.00%
21	0.00%	7.97%	-	-	7.30%	-	-	-	-	-	-	-
24	-	-8.41%	100.00%	100.00%	-7.16%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	2.18%	100.00%	-	4.10%	-

Notes:

Shading indicates Project impact.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	111	136	101	784	106	150	1248	1
v/c Ratio	0.36	0.83	0.23	0.38	0.10	0.65	0.60	0.00
Control Delay	5.1	71.3	6.1	13.7	2.1	38.3	9.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	71.3	6.1	13.7	2.1	38.3	9.3	0.0
Queue Length 50th (ft)	0	48	0	73	0	49	130	0
Queue Length 95th (ft)	16	#146	30	108	18	#117	195	0
Internal Link Dist (ft)				226			582	
Turn Bay Length (ft)		100			200	170		
Base Capacity (vph)	528	163	731	2170	1038	288	2315	1086
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.83	0.14	0.36	0.10	0.52	0.54	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	25	251	166	44	29	276	966	93	1355	99
v/c Ratio	0.52	0.21	0.63	0.82	0.33	0.13	0.83	0.36	0.56	0.84	0.13
Control Delay	57.1	53.7	13.7	78.5	55.7	1.2	65.6	14.4	61.5	32.7	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	57.1	53.7	13.7	78.5	55.7	1.2	65.6	14.4	61.5	33.1	3.5
Queue Length 50th (ft)	79	17	0	118	31	0	193	130	65	436	0
Queue Length 95th (ft)	#152	46	42	#244	68	0	#347	183	120	569	28
Internal Link Dist (ft)		707			424			403		608	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	220	464	836	203	476	498	332	2674	213	1617	778
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	49	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.05	0.30	0.82	0.09	0.06	0.83	0.36	0.44	0.86	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	63	864	157	61	1461
v/c Ratio	0.31	0.22	0.31	0.12	0.29	0.61
Control Delay	20.5	8.2	8.0	0.8	24.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	8.2	8.0	0.8	24.1	6.2
Queue Length 50th (ft)	20	0	56	0	16	95
Queue Length 95th (ft)	41	24	87	10	45	164
Internal Link Dist (ft)	356		608			327
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1185	587	2806	1486	213	2408
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.11	0.31	0.11	0.29	0.61

Intersection Summary

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	214	126	1709	199	120	1380
v/c Ratio	0.55	1.95	0.32	0.62	0.17	0.90	0.58
Control Delay	16.7	479.0	7.7	13.9	1.2	95.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	479.0	7.7	13.9	1.2	95.8	8.6
Queue Length 50th (ft)	7	~170	0	191	0	61	158
Queue Length 95th (ft)	59	#322	41	276	21	#172	265
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	409	110	564	2901	1155	134	2462
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.95	0.22	0.59	0.17	0.90	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	207	30	391	146	28	35	381	2042	65	1832	132
v/c Ratio	0.94	0.25	0.71	0.79	0.23	0.18	1.14	0.64	0.48	1.05	0.16
Control Delay	101.8	59.2	13.1	83.1	58.8	1.9	137.3	16.4	66.2	65.7	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	22.4	0.0
Total Delay	101.8	59.2	13.1	83.1	58.8	1.9	137.3	18.5	66.2	88.1	6.2
Queue Length 50th (ft)	~183	23	0	114	22	0	~350	358	50	~822	13
Queue Length 95th (ft)	#358	55	52	#236	53	0	#578	481	100	#1036	51
Internal Link Dist (ft)		707			559			403		618	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	220	444	961	184	444	450	334	3177	171	1752	830
Starvation Cap Reductn	0	0	0	0	0	0	0	940	0	158	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.07	0.41	0.79	0.06	0.08	1.14	0.91	0.38	1.15	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	402	182	1822	387	161	1677
v/c Ratio	0.56	0.38	0.78	0.32	0.72	0.72
Control Delay	26.4	6.4	18.6	2.1	49.1	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	6.4	18.6	2.1	49.1	10.4
Queue Length 50th (ft)	74	0	214	18	63	194
Queue Length 95th (ft)	113	43	307	38	#158	332
Internal Link Dist (ft)	464		618			317
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	940	565	2335	1307	228	2316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.32	0.78	0.30	0.71	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	236	69	1490	196	105	1491
v/c Ratio	0.24	1.52	0.20	0.57	0.17	0.88	0.64
Control Delay	1.9	294.2	4.6	11.4	1.1	91.1	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	294.2	4.6	11.4	1.1	91.1	8.5
Queue Length 50th (ft)	0	~141	0	142	0	43	174
Queue Length 95th (ft)	0	#265	19	183	16	#130	239
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	533	155	668	2816	1174	120	2466
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	1.52	0.10	0.53	0.17	0.88	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	161	28	310	181	29	24	314	1850	67	1805	145
v/c Ratio	0.76	0.24	0.66	0.98	0.26	0.12	1.01	0.58	0.49	0.99	0.17
Control Delay	76.3	59.5	13.3	115.9	60.5	1.2	104.2	15.0	65.9	50.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	27.0	0.0
Total Delay	76.3	59.5	13.3	115.9	60.5	1.2	104.2	16.2	65.9	77.0	6.5
Queue Length 50th (ft)	127	22	0	145	22	0	~253	305	51	719	18
Queue Length 95th (ft)	#265	54	48	#303	54	0	#460	397	101	#960	55
Internal Link Dist (ft)		707			531			403		668	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	212	446	915	185	429	473	311	3168	173	1815	857
Starvation Cap Reductn	0	0	0	0	0	0	0	992	0	134	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.06	0.34	0.98	0.07	0.05	1.01	0.85	0.39	1.07	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	477	262	1500	505	253	1624
v/c Ratio	0.61	0.46	0.79	0.44	0.72	0.72
Control Delay	26.8	6.2	24.4	4.1	38.0	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	6.2	24.4	4.1	38.0	11.1
Queue Length 50th (ft)	91	0	215	39	99	222
Queue Length 95th (ft)	135	51	#310	85	#176	311
Internal Link Dist (ft)	372		668			267
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	916	614	1891	1189	406	2256
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.43	0.79	0.42	0.62	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option C

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1,900	600	465	2,500	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative Long-Term Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative-Short TermP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	101	15	#107	190	-	-	-	-	#97	-	17
8	Sierra College Boulevard & Granite Drive	**#347**	183	-	120	**569**	28	#152	46	42	**#244**	68	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	87	10	44	164	-	-	-	-	41	-	24
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Project Driveway East & Brace Road	-	0	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	253	16	#124	241	-	-	-	#29	**#160**	-	33
8	Sierra College Boulevard & Granite Drive	**#578**	**481**	-	100	**#1036**	51	**#358**	55	52	**#236**	53	-
21	Sierra College Boulevard & Driveway South of Brace Road	-	-	-	-	-	-	-	-	5	-	-	-
24	Sierra College Boulevard & Project Driveway	-	#339	36	#147	338	-	-	-	-	102	-	40
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	195	15	#109	263	-	-	-	-	#171	-	10
8	Sierra College Boulevard & Granite Drive	**#460**	**397**	-	101	**#960**	55	**#265**	54	48	**#303**	54	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	-	#270	80	#195	317	-	-	-	-	122	-	47
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Short TermP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	2.59%	0.00%	0.00%	1.79%	0.00%	-	-	0.00%	0.00%	-	2.06%
8	0.00%	13.31%	8.13%	0.00%	8.15%	2.11%	1.85%	4.17%	0.00%	6.29%	2.38%	0.00%
21	0.00%	2.28%	-	-	1.50%	0.00%	-	-	-	-	-	-
24	-	-4.40%	100.00%	100.00%	-2.46%	-	-	-	-	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.00%	-	-	0.90%	-
37	100.00%	-	100.00%	-	-	-	-	0.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Short TermP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	3.79%	0.00%	6.09%	4.23%	-	-	-	0.00%	0.00%	-	2.42%
8	0.00%	14.05%	29.59%	0.00%	15.74%	5.65%	3.59%	7.14%	0.00%	21.90%	7.69%	0.00%
21	0.00%	3.40%	-	-	3.36%	0.00%	-	-	0.00%	-	-	-
24	-	-5.55%	100.00%	100.00%	-5.57%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	0.93%	-
37	100.00%	-	100.00%	-	-	-	-	1.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Short TermP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	8.22%	0.00%	14.85%	7.97%	-	-	-	0.00%	0.00%	-	8.33%
8	0.00%	20.69%	37.58%	0.00%	18.58%	9.35%	9.03%	14.81%	0.00%	32.18%	14.29%	0.00%
21	0.00%	7.29%	-	-	6.65%	-	-	-	-	-	-	-
24	-	-8.41%	100.00%	100.00%	-7.16%	-	-	-	-	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	2.09%	-
37	100.00%	-	100.00%	-	-	-	-	2.18%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	111	134	103	782	104	150	1248	1
v/c Ratio	0.32	0.55	0.20	0.37	0.10	0.67	0.58	0.00
Control Delay	2.5	31.5	2.8	14.0	1.8	38.0	9.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	31.5	2.8	14.0	1.8	38.0	9.7	0.0
Queue Length 50th (ft)	0	38	0	69	0	42	130	0
Queue Length 95th (ft)	0	#97	17	101	15	#107	190	0
Internal Link Dist (ft)				218			582	
Turn Bay Length (ft)		100			200	170		
Base Capacity (vph)	344	250	582	2133	1034	264	2151	1029
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.54	0.18	0.37	0.10	0.57	0.58	0.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	25	251	166	44	29	276	966	93	1355	99
v/c Ratio	0.52	0.21	0.63	0.82	0.33	0.13	0.83	0.36	0.56	0.84	0.13
Control Delay	57.1	53.7	13.7	78.5	55.7	1.2	65.6	14.4	61.5	32.7	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Total Delay	57.1	53.7	13.7	78.5	55.7	1.2	65.6	14.4	61.5	33.6	3.5
Queue Length 50th (ft)	79	17	0	118	31	0	193	130	65	436	0
Queue Length 95th (ft)	#152	46	42	#244	68	0	#347	183	120	569	28
Internal Link Dist (ft)		707			445			403		593	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	220	464	836	203	476	498	332	2670	213	1617	778
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	87	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.05	0.30	0.82	0.09	0.06	0.83	0.36	0.44	0.89	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	59	864	157	59	1461
v/c Ratio	0.31	0.21	0.31	0.12	0.28	0.61
Control Delay	20.5	8.3	8.0	0.8	23.9	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	8.3	8.0	0.8	23.9	6.2
Queue Length 50th (ft)	20	0	56	0	16	95
Queue Length 95th (ft)	41	24	87	10	44	164
Internal Link Dist (ft)	356		593			350
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1185	585	2806	1486	213	2408
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.10	0.31	0.11	0.28	0.61

Intersection Summary

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	207	129	1706	196	120	1380
v/c Ratio	0.54	0.72	0.26	0.80	0.17	0.80	0.68
Control Delay	10.3	40.4	5.3	19.3	1.1	67.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	40.4	5.3	19.3	1.1	67.6	11.5
Queue Length 50th (ft)	0	72	0	195	0	44	172
Queue Length 95th (ft)	#29	#160	33	253	16	#124	241
Internal Link Dist (ft)				222			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	272	303	557	2122	1166	154	2028
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.68	0.23	0.80	0.17	0.78	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	207	30	391	146	28	35	381	2042	65	1832	132
v/c Ratio	0.94	0.25	0.71	0.79	0.23	0.18	1.14	0.64	0.48	1.05	0.16
Control Delay	101.8	59.2	13.1	83.1	58.8	1.9	137.3	16.4	66.2	65.7	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	22.4	0.0
Total Delay	101.8	59.2	13.1	83.1	58.8	1.9	137.3	18.5	66.2	88.1	6.2
Queue Length 50th (ft)	~183	23	0	114	22	0	~350	358	50	~822	13
Queue Length 95th (ft)	#358	55	52	#236	53	0	#578	481	100	#1036	51
Internal Link Dist (ft)		707			593			403		593	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	220	444	961	184	444	450	334	3176	171	1752	830
Starvation Cap Reductn	0	0	0	0	0	0	0	939	0	184	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.07	0.41	0.79	0.06	0.08	1.14	0.91	0.38	1.17	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	402	175	1822	387	154	1677
v/c Ratio	0.53	0.36	0.83	0.32	0.70	0.75
Control Delay	23.4	6.0	20.4	2.1	46.8	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	6.0	20.4	2.1	46.8	11.3
Queue Length 50th (ft)	67	0	202	16	55	186
Queue Length 95th (ft)	102	40	#339	36	#147	338
Internal Link Dist (ft)	464		593			346
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	1026	596	2200	1313	220	2234
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.29	0.83	0.29	0.70	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	224	75	1483	190	105	1491
v/c Ratio	0.24	0.76	0.17	0.66	0.15	0.78	0.74
Control Delay	1.9	42.5	2.2	14.4	1.1	66.7	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	42.5	2.2	14.4	1.1	66.7	12.0
Queue Length 50th (ft)	0	72	0	146	0	35	183
Queue Length 95th (ft)	0	#171	10	195	15	#109	263
Internal Link Dist (ft)				222			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	297	295	537	2250	1199	135	2012
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.76	0.14	0.66	0.16	0.78	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	161	28	310	181	29	24	314	1850	67	1805	145
v/c Ratio	0.76	0.24	0.66	0.98	0.26	0.12	1.01	0.58	0.49	0.99	0.17
Control Delay	76.3	59.5	13.3	115.9	60.5	1.2	104.2	15.0	65.9	50.1	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	38.1	0.0
Total Delay	76.3	59.5	13.3	115.9	60.5	1.2	104.2	16.2	65.9	88.1	6.5
Queue Length 50th (ft)	127	22	0	145	22	0	~253	305	51	719	18
Queue Length 95th (ft)	#265	54	48	#303	54	0	#460	397	101	#960	55
Internal Link Dist (ft)		707			468			403		592	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	212	446	915	185	429	473	311	3165	173	1815	857
Starvation Cap Reductn	0	0	0	0	0	0	0	988	0	215	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.06	0.34	0.98	0.07	0.05	1.01	0.85	0.39	1.13	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	477	249	1500	505	240	1624
v/c Ratio	0.57	0.44	0.81	0.45	0.77	0.75
Control Delay	23.5	5.6	23.4	4.2	43.8	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	5.6	23.4	4.2	43.8	12.0
Queue Length 50th (ft)	81	0	191	41	89	213
Queue Length 95th (ft)	122	47	#270	80	#195	317
Internal Link Dist (ft)	372		592			347
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	996	636	1848	1199	328	2168
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.39	0.81	0.42	0.73	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Cumulative Conditions – Long Term Baseline

Cumulative Long-Term Conditions - Storage Length

Intersection #	Street Name North-South	Storage Length (feet) NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	200	970	350	280	490	-	65	215	150	95	585	-
2	Taylor Road & Horseshoe Bar Road	100	400	125	190	380	-	-	115	-	-	160	160
3	Horseshoe Bar Road & I-80 Westbound Ramp	85	680	-	160	450	95	-	935	250	275	95	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	2,350	100	-	685	-	-	-	-	-	1,080	-
5	Barton Road & Brace Road	-	2,895	-	-	-	-	-	1,980	-	-	560	-
6	Sierra College Boulevard & Taylor Road	210	550	550	210	1,500	450	150	900	250	215	2,060	215
7	Sierra College Boulevard & Brace Road	-	1,265	200	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	60	230	150
9	Sierra College Boulevard & I-80 WB Ramps	200	1,530	325	-	370	150	530	-	530	740	1,320	740
10	Sierra College Boulevard & I-80 EB Ramps	-	710	280	250	1,530	500	1,315	1,315	205	345	-	330
11	Sierra College Boulevard & Schriber Way	90	395	-	-	300	100	200	200	-	-	415	415
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	150	1,675	45	220	710	200	130	2,000	75	265	745	150
13	Sierra College Boulevard & Stadium Dwy	200	1,580	-	-	1,690	-	200	-	60	-	-	-
14	Sierra College Boulevard & Rocklin Road	245	650	-	245	1,575	175	240	925	925	315	1,325	-
15	Pacific Street & Dominguez Road/Delmar Avenue	210	1,860	-	200	850	150	-	700	315	-	1,935	140
16	Pacific Street & Rocklin Road	265	420	110	230	410	-	130	285	-	250	330	330
17	Granite Drive & Rocklin Road	100	140	-	325	625	625	225	675	-	135	650	150
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	635	1,165	-	-	580	280	300	555	-
19	I-80 Eastbound Ramps & Rocklin Road	455	1,115	455	-	-	-	170	520	-	-	370	-
20	Aguilar Road & Rocklin Road	320	-	320	-	-	-	75	400	-	85	1,260	-
21	Sierra College Boulevard & Driveway South of Brace Road	135	1,000	-	-	220	-	-	-	60	-	-	-
22	Dominguez Road & Granite Driive	200	1,390	-	200	730	-	200	370	-	200	2,000	-
23	El Don Drive & Rocklin Road	140	530	-	-	580	95	410	1,260	-	265	1,430	-
24	Sierra College Boulevard & Project Driveway	160	-	-	-	-	-	250	250	-	-	-	-
25	Brace Road & Project Driveway	Does not exist											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	900	900	-	200	800	-	250	1900	520	360	2500	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	4,500	-	100	1,300	-	-	-	-	1,450	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	105	1,100	-	105	3,100	-	-	85	30	-	910	30
29	Taylor Road & English Colony Way-Rock Springs Road	150	1,900	-	140	350	115	-	560	30	-	940	-
30	Taylor Road & Penryn Road (North	85	170	-	-	555	-	55	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	2,600	-	85	180	-	-	-	-	495	-	-
32	Taylor Road & Del Oro High School North Lot	-	185	-	70	1,600	-	-	-	-	200	-	45
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Drop Off	150	300	-	90	190	-	-	50	-	-	75	-
34	Taylor Road & Del Oro High School South Lot	-	1,200	-	150	300	-	-	-	-	65	-	65
35	Taylor Road & Rippey Road	140	465	-	-	610	-	3,500	-	-	-	-	-
36	Taylor Road & Webb Street	185	370	-	160	500	105	-	-	1,070	-	190	-
37	Project Driveway East & Brace Road	Does not exist											

Cumulative-Long Term AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#417**	527	35	#141	**#527**	-	**206**	170	98	**299**	#485	-
2	Taylor Road & Horseshoe Bar Road	-	**#432**	-	**#495**	284	-	-	75	-	-	19	**167**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**#308**	183	-	49	97	**108**	-	71	7	46	81	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	3	-	-	-	-	-	685	-
5	Barton Road & Brace Road	-	20	-	-	-	-	-	-	-	-	8	-
6	Sierra College Boulevard & Taylor Road	**#424**	280	28	113	#1012	127	**#198**	171	-	**#381**	#561	5
7	Sierra College Boulevard & Brace Road	-	186	-	#85	216	-	-	-	11	**#185**	-	45
8	Sierra College Boulevard & Granite Drive	**#461**	285	24	118	586	67	106	26	34	**#263**	56	-
9	Sierra College Boulevard & I-80 WB Ramps	#190	242	31	-	**803**	2	20	-	55	429	202	138
10	Sierra College Boulevard & I-80 EB Ramps	-	297	-	m150	#1336	m15	258	73	**#574**	42	-	-
11	Sierra College Boulevard & Schriber Way	**115**	117	-	-	**#1607**	90	**#213**	55	-	-	49	53
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	**#551**	240	28	104	**#1436**	153	**#293**	64	**138**	83	173	-
13	Sierra College Boulevard & Stadium Dwy	**#275**	127	-	-	675	-	39	-	20	-	-	-
14	Sierra College Boulevard & Rocklin Road	**#334**	#592	-	**#253**	342	95	#160	250	72	**#318**	243	-
15	Pacific Street & Dominguez Road/Delmar Avenue	**#390**	350	-	90	#724	34	-	77	47	-	#525	12
16	Pacific Street & Rocklin Road	100	369	**#900**	**#488**	325	-	56	81	-	**#744**	**#770**	117
17	Granite Drive & Rocklin Road	37	29	-	184	183	47	#195	#471	-	31	#571	**251**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	91	#379	-	-	#374	64	**#353**	268	-
19	I-80 Eastbound Ramps & Rocklin Road	**476**	#883	**#811**	-	-	-	**#303**	304	-	-	**#556**	37
20	Aguilar Road & Rocklin Road	#270	-	29	-	-	-	62	**#503**	-	43	114	-
21	Sierra College Boulevard & Driveway South of Brace Road	20	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	#90	42	-	#133	157	-	#155	192	-	**#207**	#452	-
23	El Don Drive & Rocklin Road	**189**	35	-	-	#76	-	**#965**	345	-	26	228	-
24	Sierra College Boulevard & Project Driveway	**180**	-	-	-	-	-	-	20	-	-	-	-
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	#755	-	-	21	-	-	-	258	**#915**	**#741**	316	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	152	-	**#214**	374	-	-	-	-	55	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	3	-	-	-	38	-	-	470	**53**
29	Taylor Road & English Colony Way-Rock Springs Road	**#202**	164	-	25	**#668**	**136**	-	118	**35**	-	184	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	5	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	169	-	**147**	**299**	-	-	-	-	63	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	35	-	-	-	-	-	**280**	-	13
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dr	-	-	-	15	-	-	-	-	-	-	**898**	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	20	-	-	-	-	-	**333**	-	18
35	Taylor Road & Rippey Road	10	-	-	-	-	-	23	-	-	-	-	-
36	Taylor Road & Webb Street	13	-	-	3	-	-	-	-	215	-	85	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity.

Cumulative-Long Term PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#533**	370	57	103	183	-	**112**	**277**	147	**115**	135	-
2	Taylor Road & Horseshoe Bar Road	49	**#989**	59	**#788**	339	-	-	96	-	-	128	**367**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**207**	356	-	69	186	**100**	-	#196	6	**97**	**92**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	10	-	-	-	-	-	**2005**	-
5	Barton Road & Brace Road	-	73	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	**#217**	**#855**	286	#88	470	14	**190**	#500	172	**#355**	242	1
7	Sierra College Boulevard & Brace Road	-	**#1792**	-	**#612**	203	-	-	-	**#878**	**149**	-	57
8	Sierra College Boulevard & Granite Drive	**#319**	**#1078**	6	#214	487	86	**#631**	48	45	**162**	58	22
9	Sierra College Boulevard & I-80 WB Ramps	**m#528**	m540	m43	-	**#874**	-	#88	-	59	#628	184	111
10	Sierra College Boulevard & I-80 EB Ramps	-	495	45	m#164	m292	m1	306	128	53	#257	-	**#517**
11	Sierra College Boulevard & Schriber Way	82	356	-	-	**#809**	87	183	50	-	-	53	31
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	**#575**	#1032	**102**	**#243**	**#1088**	22	**#438**	83	**#496**	#150	145	-
13	Sierra College Boulevard & Stadium Dwy	80	#1027	-	-	414	-	130	-	**77**	-	-	-
14	Sierra College Boulevard & Rocklin Road	**#345**	**#1653**	-	**#646**	608	131	**#644**	194	#779	#243	240	-
15	Pacific Street & Dominguez Road/Delmar Avenue	**242**	**#2072**	-	#127	596	-	-	#605	**83**	-	#498	23
16	Pacific Street & Rocklin Road	97	416	**#950**	**#389**	**450**	-	101	188	-	**#812**	**#836**	173
17	Granite Drive & Rocklin Road	83	48	-	254	255	60	**#437**	479	-	#61	#614	**#380**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	108	#468	-	-	**#708**	**277**	**#878**	283	-
19	I-80 Eastbound Ramps & Rocklin Road	**#465**	#356	#266	-	-	-	**#403**	156	-	-	**#738**	42
20	Aguilar Road & Rocklin Road	135	-	8	-	-	-	51	#255	-	51	#288	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	8	-	-	-
22	Dominguez Road & Granite Driive	61	#305	-	**#212**	108	-	#90	**#424**	-	**#202**	203	-
23	El Don Drive & Rocklin Road	89	23	-	-	#331	#93	#253	213	-	40	259	-
24	Sierra College Boulevard & Project Driveway	48	-	-	-	-	-	**408**	53	-	-	-	-
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	**#1757**	46	-	-	-	-	20	#769	#477	**#385**	431	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	#1138	-	**#388**	153	-	-	-	-	186	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	3	-	-	8	-	-	-	-	-	-	-	5
29	Taylor Road & English Colony Way-Rock Springs Road	118	#443	-	29	164	28	-	#361	**62**	-	91	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	#260	-	**#192**	24	-	-	-	-	46	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	20	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dr	-	-	-	-	-	-	-	-	-	-	13	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	50	-	8
35	Taylor Road & Rippey Road	3	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	23	-	-	-	-	-	-	-	38	-	3	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity.

Cumulative-Long Term SAT

Intersection #	Street Name North-South	95th Percentile Queues NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#287**	229	33	46	85	-	**77**	85	45	**110**	53	-
2	Taylor Road & Horseshoe Bar Road	36	**#504**	44	**#407**	219	-	-	39	-	-	105	**105**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**#325**	260	-	51	161	**89**	-	#201	-	66	**115**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	8	-	-	-	-	-	**1393**	-
5	Barton Road & Brace Road	-	210	-	-	-	-	-	-	-	-	8	-
6	Sierra College Boulevard & Taylor Road	#205	267	130	58	#287	5	92	182	103	**#256**	134	-
7	Sierra College Boulevard & Brace Road	-	#530	-	**#264**	93	-	-	-	#191	**115**	-	39
8	Sierra College Boulevard & Granite Drive	#244	**384**	28	#143	260	44	**#301**	34	36	**138**	45	2
9	Sierra College Boulevard & I-80 WB Ramps	**m#599**	m336	m27	-	**#595**	-	#190	-	223	547	193	96
10	Sierra College Boulevard & I-80 EB Ramps	-	277	14	m212	m178	m8	277	172	26	#194	-	**#443**
11	Sierra College Boulevard & Schriber Way	59	137	-	-	**#478**	78	155	42	-	-	38	34
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	**#759**	332	**95**	173	#585	172	**#427**	129	**94**	64	267	-
13	Sierra College Boulevard & Stadium Dwy	32	221	-	-	176	-	28	-	23	-	-	-
14	Sierra College Boulevard & Rocklin Road	146	**#714**	-	**#354**	281	33	201	132	116	#160	113	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#155	#547	-	37	#368	17	-	136	40	-	63	-
16	Pacific Street & Rocklin Road	31	223	**208**	**#243**	195	-	70	83	-	240	245	44
17	Granite Drive & Rocklin Road	69	47	-	189	191	52	**#419**	263	-	43	195	86
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	54	89	-	-	280	77	**323**	109	-
19	I-80 Eastbound Ramps & Rocklin Road	#230	#207	75	-	-	-	#164	73	-	-	#237	26
20	Aguilar Road & Rocklin Road	128	-	9	-	-	-	52	119	-	39	103	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	57	#352	-	140	118	-	#166	**#378**	-	**#263**	218	-
23	El Don Drive & Rocklin Road	71	20	-	-	56	-	45	163	-	39	120	-
24	Sierra College Boulevard & Project Driveway	28	-	-	-	-	-	**328**	38	-	-	-	-
25	Brace Road & Project Driveway	DNE											
26	Sierra College Boulevard/Sierra College Blvd & SR 193	**#1625**	32	-	21	34	-	21	#628	#349	**#680**	187	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	297	-	**#165**	122	-	-	-	-	69	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	-	-	20	-	-	-	48	-	-	170	-
29	Taylor Road & English Colony Way-Rock Springs Road	**141**	326	-	33	199	25	-	361	**95**	-	105	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	132	-	**#170**	30	-	-	-	-	35	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	3	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dr	-	-	-	3	-	-	-	-	-	-	40	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	45	-	8
35	Taylor Road & Rippey Road	5	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	13	-	-	-	-	-	-	-	75	-	128	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	184	149	351	270	385	293	552	109	80	931
v/c Ratio	0.71	0.58	0.71	0.67	0.92	0.94	0.73	0.16	0.70	0.95
Control Delay	63.4	56.5	15.4	52.0	70.9	87.9	37.9	5.3	87.1	61.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	56.5	15.4	52.0	70.9	87.9	37.9	5.3	87.1	61.0
Queue Length 50th (ft)	137	109	18	190	274	226	355	0	61	361
Queue Length 95th (ft)	206	170	98	299	#485	#417	527	35	#141	#527
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	409	403	587	405	418	311	760	674	120	975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.60	0.67	0.92	0.94	0.73	0.16	0.67	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	10	457	516	5	575	844
v/c Ratio	0.45	0.06	0.62	0.82	0.01	0.84	0.58
Control Delay	40.5	33.4	16.7	36.8	0.0	36.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	33.4	16.7	36.8	0.0	36.1	6.0
Queue Length 50th (ft)	34	5	141	233	0	264	130
Queue Length 95th (ft)	75	19	167	#432	0	#495	284
Internal Link Dist (ft)	142	528		1160			350
Turn Bay Length (ft)					125	190	
Base Capacity (vph)	330	429	794	736	664	761	1459
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.02	0.58	0.70	0.01	0.76	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	66	33	82	308	626	33	110	681
v/c Ratio	0.53	0.16	0.14	0.33	0.67	0.31	0.18	0.21	0.73
Control Delay	47.4	1.9	35.8	33.1	36.4	12.7	39.8	24.9	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	1.9	35.8	33.1	36.4	12.7	39.8	24.9	7.9
Queue Length 50th (ft)	27	0	15	30	131	67	15	39	0
Queue Length 95th (ft)	71	7	46	81	#308	183	49	97	108
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	252	774	618	612	671	2086	222	800	1059
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.09	0.05	0.13	0.46	0.30	0.15	0.14	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	117	80	489	378	69	234	702	218	64	1585	266
v/c Ratio	0.87	0.42	0.22	1.04	0.94	0.16	1.04	0.40	0.19	0.54	1.03	0.29
Control Delay	126.4	62.0	1.5	112.5	87.4	1.4	131.3	23.4	1.5	84.1	71.6	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.4	62.0	1.5	112.5	87.4	1.4	131.3	23.4	1.5	84.1	71.6	10.7
Queue Length 50th (ft)	89	104	0	~265	364	0	~247	224	0	61	~873	69
Queue Length 95th (ft)	#198	171	0	#381	#561	5	#424	280	28	113	#1012	127
Internal Link Dist (ft)		429			1915			582			5309	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	104	288	363	472	413	448	225	1772	1135	141	1542	911
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.41	0.22	1.04	0.92	0.15	1.04	0.40	0.19	0.45	1.03	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	69	314	234	921	85	2038
v/c Ratio	0.18	0.72	0.43	0.58	0.63	0.68
Control Delay	2.5	30.9	5.8	14.1	49.5	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	30.9	5.8	14.1	49.5	9.9
Queue Length 50th (ft)	0	101	0	130	30	168
Queue Length 95th (ft)	11	#185	45	186	#85	216
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)		100			170	
Base Capacity (vph)	485	483	579	1599	148	2996
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.65	0.40	0.58	0.57	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	73	10	130	167	31	26	365	1026	83	1927	151
v/c Ratio	0.52	0.10	0.50	0.86	0.24	0.12	0.87	0.36	0.55	0.87	0.20
Control Delay	66.3	56.6	16.2	89.0	57.5	1.2	66.2	13.3	66.8	36.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	66.3	56.6	16.2	89.0	57.5	1.2	66.2	13.6	66.8	36.6	8.9
Queue Length 50th (ft)	55	8	0	130	23	0	275	140	63	489	23
Queue Length 95th (ft)	106	26	34	#263	56	0	#461	191	118	586	67
Internal Link Dist (ft)		707			453			403		628	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	181	429	701	195	439	462	419	2856	193	2210	740
Starvation Cap Reductn	0	0	0	0	0	0	0	1067	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.02	0.19	0.86	0.07	0.06	0.87	0.57	0.43	0.87	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	71	799	219	211	87	1076	163	2266	54
v/c Ratio	0.08	0.42	0.89	0.49	0.46	0.84	0.33	0.16	0.86	0.06
Control Delay	71.2	24.4	64.4	31.0	18.3	114.4	11.5	2.9	31.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.6	0.0
Total Delay	71.2	24.4	64.4	31.0	18.3	114.4	11.5	2.9	78.3	0.3
Queue Length 50th (ft)	5	6	378	108	52	85	121	0	640	0
Queue Length 95th (ft)	20	55	429	202	138	#190	242	31	803	2
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	61	169	1141	476	492	104	3231	999	2632	960
Starvation Cap Reductn	0	0	0	0	0	0	0	0	680	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.42	0.70	0.46	0.43	0.84	0.33	0.16	1.16	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	549	125	462	16	33	1266	38	239	2152	185
v/c Ratio	0.56	0.13	0.97	0.19	0.14	0.44	0.05	0.76	0.98	0.19
Control Delay	44.1	39.8	76.1	72.3	1.3	25.5	0.1	82.8	34.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Total Delay	44.1	39.8	76.1	72.3	1.3	26.4	0.1	82.8	34.8	1.9
Queue Length 50th (ft)	231	46	356	15	0	213	0	115	682	1
Queue Length 95th (ft)	258	73	#574	42	0	297	0	m150	#1336	m15
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	998	1008	500	84	261	2871	819	387	2207	993
Starvation Cap Reductn	0	0	0	0	0	1210	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.12	0.92	0.19	0.13	0.76	0.05	0.62	0.98	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	141	76	21	76	65	1109	2429	201
v/c Ratio	0.76	0.33	0.22	0.55	0.45	0.24	1.10	0.19
Control Delay	89.7	18.3	72.5	28.1	76.0	6.0	81.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.9
Total Delay	89.7	18.3	72.5	28.1	76.0	6.3	81.6	8.7
Queue Length 50th (ft)	135	4	20	0	62	86	~1434	47
Queue Length 95th (ft)	#213	55	49	53	115	117	#1607	90
Internal Link Dist (ft)		343	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	212	254	218	223	145	4584	2202	1041
Starvation Cap Reductn	0	0	0	0	0	2525	413	595
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.30	0.10	0.34	0.45	0.54	1.36	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	38	261	114	130	11	315	1027	82	65	2207	245
v/c Ratio	1.28	0.16	0.68	0.52	0.61	0.05	1.30	0.36	0.09	0.56	1.25	0.38
Control Delay	225.8	52.3	23.4	66.7	66.9	0.4	204.2	16.7	3.9	75.2	145.3	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6
Total Delay	225.8	52.3	23.4	66.7	66.9	0.4	204.2	16.7	3.9	75.2	146.0	15.5
Queue Length 50th (ft)	~144	29	44	47	106	0	~337	170	1	53	~1212	78
Queue Length 95th (ft)	#293	64	138	83	173	0	#551	240	28	104	#1436	153
Internal Link Dist (ft)		2100			372			343			363	
Turn Bay Length (ft)	130		75	265		150	150		45	220		200
Base Capacity (vph)	106	518	589	252	512	411	243	2814	886	161	1772	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	329	164
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.07	0.44	0.45	0.25	0.03	1.30	0.36	0.09	0.40	1.53	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	53	20	230	1592	3342
v/c Ratio	0.29	0.19	0.89	0.52	0.98
Control Delay	66.5	27.0	91.2	2.6	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	27.0	91.2	2.6	30.3
Queue Length 50th (ft)	24	0	206	128	973
Queue Length 95th (ft)	39	20	#275	127	675
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	478	248	259	3075	3412
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.08	0.89	0.52	0.98

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	114	630	245	201	736	529	1196	163	1266	332
v/c Ratio	0.71	0.67	0.43	1.25	0.74	1.18	1.00	1.03	0.78	0.48
Control Delay	69.6	36.8	8.0	194.1	30.5	143.5	59.5	124.6	35.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	36.8	8.0	194.1	30.5	143.5	59.5	124.6	35.1	8.0
Queue Length 50th (ft)	73	190	12	~165	175	~216	~412	~114	271	21
Queue Length 95th (ft)	#160	250	72	#318	243	#334	#592	#253	342	95
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	168	1087	623	161	1106	447	1196	159	1632	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.58	0.39	1.25	0.67	1.18	1.00	1.03	0.78	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	66	137	440	66	297	494	66	703	99
v/c Ratio	0.28	0.31	1.02	0.13	1.00	0.59	0.53	0.96	0.15
Control Delay	35.1	7.2	88.1	2.4	98.0	21.5	62.5	57.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	7.2	88.1	2.4	98.0	21.5	62.5	57.3	5.0
Queue Length 50th (ft)	37	0	~321	0	212	227	45	474	1
Queue Length 95th (ft)	77	47	#525	12	#390	350	90	#724	34
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	236	448	432	492	297	842	150	734	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.31	1.02	0.13	1.00	0.59	0.44	0.96	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	167	511	528	217	61	772	900	278	739
v/c Ratio	0.25	0.56	1.02	1.04	0.38	0.49	0.63	1.09	1.24	0.51
Control Delay	63.1	42.2	91.3	94.7	14.5	72.3	38.2	80.9	186.9	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	42.2	91.3	94.7	14.5	72.3	38.2	80.9	186.9	29.8
Queue Length 50th (ft)	23	43	~486	~508	44	51	286	~619	~293	245
Queue Length 95th (ft)	56	81	#744	#770	117	100	369	#900	#488	325
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	328	762	500	509	572	148	1218	826	224	1456
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.22	1.02	1.04	0.38	0.41	0.63	1.09	1.24	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	155	1218	17	1270	529	23	22	221	221	218
v/c Ratio	0.76	0.71	0.17	1.01	0.73	0.15	0.15	0.64	0.63	0.44
Control Delay	64.3	23.1	46.2	57.0	18.5	42.0	30.2	39.6	39.1	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	23.1	46.2	57.0	18.5	42.0	30.2	39.6	39.1	6.9
Queue Length 50th (ft)	84	237	9	~363	109	12	6	115	115	0
Queue Length 95th (ft)	#195	#471	31	#571	251	37	29	184	183	47
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	203	1723	98	1262	725	155	142	584	591	684
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.71	0.17	1.01	0.73	0.15	0.15	0.38	0.37	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1045	522	371	1365	107	438
v/c Ratio	0.82	0.59	0.91	0.60	0.25	0.96
Control Delay	33.5	5.3	62.3	10.6	28.6	61.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	5.3	62.3	10.6	28.6	61.5
Queue Length 50th (ft)	288	0	203	214	48	198
Queue Length 95th (ft)	#374	64	#353	268	91	#379
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1271	878	424	2275	443	466
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.59	0.88	0.60	0.24	0.94

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	211	928	1100	72	555	759	748
v/c Ratio	0.98	0.56	0.99	0.13	0.74	1.08	1.03
Control Delay	106.0	22.8	64.0	8.6	31.8	83.6	68.6
Queue Delay	0.0	0.0	9.9	0.0	0.0	0.0	0.0
Total Delay	106.0	22.8	73.9	8.6	31.8	83.6	68.6
Queue Length 50th (ft)	151	242	405	3	329	~625	~563
Queue Length 95th (ft)	#303	304	#556	37	476	#883	#811
Internal Link Dist (ft)		595	411			642	
Turn Bay Length (ft)	170				455		455
Base Capacity (vph)	215	1653	1106	539	755	706	728
Starvation Cap Reductn	0	0	38	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.56	1.03	0.13	0.74	1.08	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	57	2391	34	856	356	80
v/c Ratio	0.38	0.87	0.30	0.31	0.81	0.19
Control Delay	42.6	21.1	42.0	10.9	42.0	7.0
Queue Delay	0.0	1.0	0.0	0.0	0.0	0.0
Total Delay	42.6	22.1	42.0	10.9	42.0	7.0
Queue Length 50th (ft)	28	397	17	91	163	0
Queue Length 95th (ft)	62	#503	43	114	#270	29
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	149	2746	116	2756	518	470
Starvation Cap Reductn	0	155	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.92	0.29	0.31	0.69	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	130	272	223	560	76	141	114	522
v/c Ratio	0.79	0.58	0.78	0.94	0.56	0.14	0.70	0.49
Control Delay	68.8	30.8	51.7	51.9	52.5	16.5	59.6	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	30.8	51.7	51.9	52.5	16.5	59.6	24.0
Queue Length 50th (ft)	65	115	107	254	37	20	56	108
Queue Length 95th (ft)	#155	192	#207	#452	#90	42	#133	157
Internal Link Dist (ft)		705		2100		773		773
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	165	472	305	608	139	1024	165	1076
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.58	0.73	0.92	0.55	0.14	0.69	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	777	1337	11	685	174	33	47	45
v/c Ratio	0.96	0.40	0.09	0.67	0.63	0.12	0.52	0.23
Control Delay	54.6	12.0	50.5	42.7	53.4	21.2	51.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	12.0	50.5	42.7	53.4	21.2	51.0	2.8
Queue Length 50th (ft)	531	128	8	154	118	7	15	0
Queue Length 95th (ft)	#965	345	26	228	189	35	#76	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	810	3441	120	1136	495	485	91	195
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.39	0.09	0.60	0.35	0.07	0.52	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	233	1072	478	444	528	94	6	6
v/c Ratio	0.45	1.11	1.14	0.45	1.02	0.10	0.09	0.02
Control Delay	41.3	81.4	131.5	17.5	90.2	0.2	67.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	81.4	131.5	17.5	90.2	0.2	67.6	0.0
Queue Length 50th (ft)	156	~600	~460	189	444	0	5	0
Queue Length 95th (ft)	258	#915	#741	316	#755	0	21	0
Internal Link Dist (ft)	684			870		7195		1542
Turn Bay Length (ft)		520	360				200	
Base Capacity (vph)	520	962	421	996	518	963	67	338
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.11	1.14	0.45	1.02	0.10	0.09	0.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	219	648	302	2049
v/c Ratio	0.59	0.44	0.73	0.78
Control Delay	11.6	14.3	34.7	8.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.6	14.3	34.7	8.3
Queue Length 50th (ft)	2	85	103	157
Queue Length 95th (ft)	55	152	#214	374
Internal Link Dist (ft)	845	10454		3226
Turn Bay Length (ft)	1450		100	
Base Capacity (vph)	615	1478	470	2620
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.44	0.64	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	118	142	198	154	290	12	772	333
v/c Ratio	0.57	0.45	0.73	0.87	0.29	0.13	0.93	0.44
Control Delay	53.5	11.1	57.4	86.8	13.2	52.6	46.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	11.1	57.4	86.8	13.2	52.6	46.9	13.1
Queue Length 50th (ft)	74	0	121	101	84	8	468	76
Queue Length 95th (ft)	118	35	184	#202	164	25	#668	136
Internal Link Dist (ft)	422		500		2517		526	
Turn Bay Length (ft)		30		150		140		115
Base Capacity (vph)	310	393	326	178	1012	89	831	755
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.36	0.61	0.87	0.29	0.13	0.93	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	204	429	261	1070
v/c Ratio	0.62	0.50	0.75	0.79
Control Delay	22.8	16.7	41.7	13.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.8	16.7	41.7	13.1
Queue Length 50th (ft)	38	126	105	226
Queue Length 95th (ft)	63	169	147	299
Internal Link Dist (ft)	429	6529		184
Turn Bay Length (ft)	495		85	
Base Capacity (vph)	509	854	395	1349
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.40	0.50	0.66	0.79

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	101	270	551	90	124	461	433	360	73	371
v/c Ratio	0.29	0.73	0.77	0.48	0.62	0.78	0.52	0.42	0.50	0.72
Control Delay	37.4	50.3	13.4	53.5	51.3	42.3	26.2	4.1	59.6	48.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	50.3	13.4	53.5	51.3	42.3	26.2	4.1	59.6	48.0
Queue Length 50th (ft)	55	162	25	55	65	263	206	0	46	114
Queue Length 95th (ft)	112	277	147	115	135	#533	370	57	103	183
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	487	518	799	492	497	600	863	885	197	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.52	0.69	0.18	0.25	0.77	0.50	0.41	0.37	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	80	489	21	803	112	590	734
v/c Ratio	0.39	0.67	0.64	0.29	0.96	0.16	0.95	0.50
Control Delay	52.3	85.1	25.8	74.7	57.9	9.9	68.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	85.1	25.8	74.7	57.9	9.9	68.2	7.1
Queue Length 50th (ft)	47	69	251	18	665	20	509	220
Queue Length 95th (ft)	96	128	367	49	#989	59	#788	339
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	244	161	762	78	868	728	626	1477
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.50	0.64	0.27	0.93	0.15	0.94	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	111	64	90	133	229	1021	53	218	612
v/c Ratio	1.18	0.11	0.47	0.55	0.74	0.78	0.40	0.52	0.73
Control Delay	184.5	1.1	46.2	29.7	49.1	27.6	50.0	33.8	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	184.5	1.1	46.2	29.7	49.1	27.6	50.0	33.8	8.7
Queue Length 50th (ft)	~77	0	48	34	119	253	28	100	0
Queue Length 95th (ft)	#196	6	97	92	207	356	69	186	100
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	94	586	403	437	415	1509	145	509	880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.11	0.22	0.30	0.55	0.68	0.37	0.43	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	147	348	261	538	207	76	141	1598	598	38	1022	76
v/c Ratio	0.70	1.00	0.61	0.98	0.47	0.17	0.78	0.96	0.55	0.59	0.75	0.09
Control Delay	71.6	99.2	25.3	87.2	48.2	0.9	84.2	47.5	10.7	96.3	38.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.5	0.8	0.0	0.0	0.0
Total Delay	71.6	99.2	25.3	87.2	48.2	0.9	84.2	84.0	11.5	96.3	38.3	1.5
Queue Length 50th (ft)	120	~301	76	236	153	0	117	678	191	32	387	0
Queue Length 95th (ft)	190	#500	172	#355	242	1	#217	#855	286	#88	470	14
Internal Link Dist (ft)		429			1915			582			4602	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	262	349	429	550	436	458	194	1670	1095	64	1393	925
Starvation Cap Reductn	0	0	0	0	0	0	0	196	234	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.00	0.61	0.98	0.47	0.17	0.73	1.08	0.69	0.59	0.73	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	568	109	135	2521	328	1417
v/c Ratio	1.32	0.28	0.30	1.32	1.31	0.39
Control Delay	198.0	51.0	9.0	175.8	214.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	198.0	51.0	9.0	175.8	214.1	8.9
Queue Length 50th (ft)	~640	90	0	~1671	~412	179
Queue Length 95th (ft)	#878	149	57	#1792	#612	203
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)		100			170	
Base Capacity (vph)	429	386	446	1917	250	3610
Starvation Cap Reductn	0	0	0	0	0	1368
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.28	0.30	1.32	1.31	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	441	27	303	128	32	96	234	2043	106	1660	197
v/c Ratio	0.91	0.07	0.37	0.64	0.28	0.43	0.88	0.89	0.80	0.87	0.29
Control Delay	67.7	40.6	5.9	66.4	61.1	9.3	82.8	36.5	95.1	41.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.3	0.0	0.0	0.0
Total Delay	67.7	40.6	5.9	66.4	61.1	9.3	82.8	82.8	95.1	41.8	11.2
Queue Length 50th (ft)	339	17	0	98	25	0	184	528	84	441	35
Queue Length 95th (ft)	#546	45	42	162	58	22	#339	624	#188	525	93
Internal Link Dist (ft)		707			453			403		618	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	485	658	1178	268	446	474	266	2305	132	1907	671
Starvation Cap Reductn	0	0	0	0	0	0	0	513	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.04	0.26	0.48	0.07	0.20	0.88	1.14	0.80	0.87	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	37	128	1101	171	158	324	1952	271	2053	37
v/c Ratio	0.58	0.35	0.96	0.37	0.33	1.06	0.66	0.26	1.11	0.06
Control Delay	99.3	16.1	63.7	36.7	18.2	118.2	23.9	2.6	98.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	99.3	16.1	63.7	36.7	18.2	118.2	23.9	2.6	99.5	0.2
Queue Length 50th (ft)	34	26	495	110	44	~347	491	18	~781	0
Queue Length 95th (ft)	#88	59	#628	184	111	m#528	m540	m43	#874	0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	64	368	1190	469	482	306	2937	1035	1848	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	344	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.35	0.93	0.36	0.33	1.06	0.66	0.26	1.37	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	547	189	105	132	326	2558	168	284	1605	379
v/c Ratio	0.83	0.63	0.46	0.96	1.45	0.67	0.16	0.96	0.63	0.30
Control Delay	65.5	71.4	15.8	131.1	255.3	19.2	3.7	93.8	5.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	37.5	0.0	0.0	0.0	0.0
Total Delay	65.5	71.4	15.8	131.1	255.3	56.8	3.7	93.8	5.7	0.5
Queue Length 50th (ft)	249	89	0	122	~319	421	12	136	147	0
Queue Length 95th (ft)	306	128	53	#257	#517	495	45	m#164	m292	m1
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	760	1083	551	137	225	3843	1039	297	2559	1269
Starvation Cap Reductn	0	0	0	0	0	1469	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.17	0.19	0.96	1.45	1.08	0.16	0.96	0.63	0.30

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	168	82	32	82	60	2636	1696	207
v/c Ratio	0.70	0.29	0.26	0.40	0.39	0.60	0.82	0.21
Control Delay	60.6	15.0	53.3	11.4	53.9	10.6	26.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.8	46.1	0.0
Total Delay	60.6	15.0	53.3	11.4	53.9	11.5	72.4	8.1
Queue Length 50th (ft)	114	7	22	0	41	275	533	34
Queue Length 95th (ft)	183	50	53	31	82	356	#809	87
Internal Link Dist (ft)		220	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	289	324	297	348	155	4414	2062	966
Starvation Cap Reductn	0	0	0	0	0	1331	516	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.11	0.24	0.39	0.86	1.10	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	60	527	168	109	16	321	2457	201	109	1571	114
v/c Ratio	1.14	0.13	0.93	0.79	0.30	0.04	1.13	0.99	0.24	0.96	1.10	0.16
Control Delay	161.9	42.5	53.3	91.9	50.5	0.1	146.2	52.6	10.8	140.0	95.3	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Total Delay	161.9	42.5	53.3	91.9	50.5	0.1	146.2	52.6	10.8	140.0	97.7	2.3
Queue Length 50th (ft)	~255	44	291	83	87	0	~364	~914	46	106	~917	0
Queue Length 95th (ft)	#438	83	#496	#150	145	0	#575	#1032	102	#243	#1088	22
Internal Link Dist (ft)		2122			372			324			363	
Turn Bay Length (ft)	130		75	265		150	150		45	220		200
Base Capacity (vph)	196	548	635	213	466	510	284	2480	830	114	1432	726
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	376	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.11	0.83	0.79	0.23	0.03	1.13	0.99	0.24	0.96	1.49	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	300	184	63	2563	2231
v/c Ratio	0.61	0.51	0.42	0.96	0.69
Control Delay	43.9	14.7	50.7	23.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	14.7	50.7	23.0	13.3
Queue Length 50th (ft)	88	16	36	597	309
Queue Length 95th (ft)	130	77	80	#1027	414
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	683	439	171	2660	3241
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.42	0.37	0.96	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	355	344	672	113	484	522	2220	349	1720	242
v/c Ratio	1.38	0.41	1.14	1.01	0.79	0.89	1.48	1.43	0.86	0.35
Control Delay	236.2	48.0	112.0	153.1	52.6	77.1	250.0	258.7	45.5	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	236.2	48.0	112.0	153.1	52.6	77.1	250.0	258.7	45.5	13.6
Queue Length 50th (ft)	~442	145	~532	~110	173	251	~1522	~445	542	60
Queue Length 95th (ft)	#644	194	#779	#243	240	#345	#1653	#646	608	131
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	258	846	588	112	614	591	1504	244	2007	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.41	1.14	1.01	0.79	0.88	1.48	1.43	0.86	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	341	418	258	60	170	1390	49	560	27
v/c Ratio	1.18	0.54	1.25	0.11	0.77	1.36	0.75	0.68	0.04
Control Delay	155.2	6.1	187.1	4.7	83.5	198.0	126.5	38.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	155.2	6.1	187.1	4.7	83.5	198.0	126.5	38.0	0.1
Queue Length 50th (ft)	~402	0	~316	0	162	~1802	48	426	0
Queue Length 95th (ft)	#605	83	#498	23	242	#2072	#127	596	0
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	289	779	207	525	275	1021	65	826	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.54	1.25	0.11	0.62	1.36	0.75	0.68	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	64	308	512	525	314	53	814	894	202	910
v/c Ratio	0.30	0.71	1.06	1.08	0.52	0.50	0.65	1.08	1.12	0.62
Control Delay	58.8	65.3	106.6	110.9	16.8	80.9	40.6	80.1	157.3	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	65.3	106.6	110.9	16.8	80.9	40.6	80.1	157.3	35.5
Queue Length 50th (ft)	54	136	~536	~557	70	47	323	~655	~209	350
Queue Length 95th (ft)	101	188	#812	#836	173	97	416	#950	#389	450
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	348	692	481	486	605	116	1258	825	181	1462
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.45	1.06	1.08	0.52	0.46	0.65	1.08	1.12	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	333	1214	36	1141	536	57	37	265	266	260
v/c Ratio	0.97	0.68	0.41	1.01	0.81	0.44	0.26	0.70	0.69	0.46
Control Delay	83.0	23.9	62.9	64.0	26.1	58.6	36.4	45.9	45.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.0	23.9	62.9	64.0	26.1	58.6	36.4	45.9	45.7	6.7
Queue Length 50th (ft)	216	331	23	~396	153	36	13	165	166	0
Queue Length 95th (ft)	#437	479	#61	#614	#380	83	48	254	255	60
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	345	1779	88	1134	663	129	141	533	537	681
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.68	0.41	1.01	0.81	0.44	0.26	0.50	0.50	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1184	563	674	1426	74	352
v/c Ratio	0.97	0.71	1.00	0.54	0.24	1.02
Control Delay	64.5	16.5	77.4	7.5	52.6	94.7
Queue Delay	0.0	0.0	25.4	0.8	0.0	0.0
Total Delay	64.5	16.5	102.8	8.4	52.6	94.7
Queue Length 50th (ft)	557	129	610	240	59	~264
Queue Length 95th (ft)	#708	277	#878	283	108	#468
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1222	793	675	2650	308	346
Starvation Cap Reductn	0	0	49	830	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.71	1.08	0.78	0.24	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	337	962	1685	147	382	367	360
v/c Ratio	1.03	0.39	1.02	0.18	1.02	0.86	0.76
Control Delay	99.3	7.4	53.8	4.8	92.4	46.6	31.0
Queue Delay	0.0	0.0	32.5	0.0	0.0	0.0	0.0
Total Delay	99.3	7.4	86.3	4.8	92.4	46.6	31.0
Queue Length 50th (ft)	~231	123	~572	8	~273	175	123
Queue Length 95th (ft)	#403	156	#738	42	#465	#356	#266
Internal Link Dist (ft)		595	411			642	
Turn Bay Length (ft)	170				455		455
Base Capacity (vph)	327	2444	1658	807	373	426	472
Starvation Cap Reductn	0	0	253	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.39	1.20	0.18	1.02	0.86	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	60	1539	60	1582	275	60
v/c Ratio	0.28	0.69	0.30	0.71	0.61	0.13
Control Delay	26.2	14.8	27.2	16.9	22.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	14.8	27.2	16.9	22.8	1.8
Queue Length 50th (ft)	17	134	18	156	75	0
Queue Length 95th (ft)	51	#255	51	#288	135	8
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	217	2242	203	2242	732	711
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.69	0.30	0.71	0.38	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	489	179	326	54	892	190	408
v/c Ratio	0.56	0.97	0.87	0.53	0.38	0.90	0.89	0.32
Control Delay	52.5	62.2	74.6	23.7	42.8	37.6	75.7	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	62.2	74.6	23.7	42.8	37.6	75.7	17.6
Queue Length 50th (ft)	37	231	89	121	26	192	95	69
Queue Length 95th (ft)	#90	#424	#202	203	61	#305	#212	108
Internal Link Dist (ft)		705		2122		773		773
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	139	506	205	620	148	990	214	1256
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.97	0.87	0.53	0.36	0.90	0.89	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	185	1027	27	1152	130	43	257	243
v/c Ratio	0.92	0.43	0.18	0.65	0.38	0.13	1.24	0.63
Control Delay	82.8	14.7	35.7	21.2	26.4	9.2	167.0	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.8	14.7	35.7	21.2	26.4	9.2	167.0	13.9
Queue Length 50th (ft)	75	75	10	131	48	2	~116	0
Queue Length 95th (ft)	#253	213	40	259	89	23	#331	#93
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	201	2413	151	1977	863	807	208	386
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.43	0.18	0.58	0.15	0.05	1.24	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	5	500	656	198	380	1276	365
v/c Ratio	0.08	1.18	0.92	1.22	0.60	1.30	0.35
Control Delay	68.2	149.7	35.7	193.8	43.0	173.1	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	149.7	35.7	193.8	43.0	173.1	2.4
Queue Length 50th (ft)	5	~547	221	~222	278	~1492	2
Queue Length 95th (ft)	20	#769	#477	#385	431	#1757	46
Internal Link Dist (ft)		684			870		8961
Turn Bay Length (ft)	250		520	360			
Base Capacity (vph)	64	423	713	162	632	978	1039
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.18	0.92	1.22	0.60	1.30	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	322	2150	258	1097
v/c Ratio	0.86	0.97	0.87	0.39
Control Delay	39.2	38.1	79.9	3.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.2	38.1	79.9	3.6
Queue Length 50th (ft)	77	~951	209	101
Queue Length 95th (ft)	186	#1138	#388	153
Internal Link Dist (ft)	845	10454		1460
Turn Bay Length (ft)	1450		100	
Base Capacity (vph)	430	2210	298	2847
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.97	0.87	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	393	208	106	129	528	17	208	146
v/c Ratio	0.82	0.38	0.45	0.53	0.67	0.14	0.39	0.25
Control Delay	43.8	8.2	36.0	41.1	25.2	40.1	28.9	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	8.2	36.0	41.1	25.2	40.1	28.9	3.7
Queue Length 50th (ft)	183	10	44	60	193	8	88	0
Queue Length 95th (ft)	#361	62	91	118	#443	29	164	28
Internal Link Dist (ft)	422		500		2517		526	
Turn Bay Length (ft)		30		150		140		115
Base Capacity (vph)	515	580	446	310	791	123	535	587
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.36	0.24	0.42	0.67	0.14	0.39	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	193	477	295	108
v/c Ratio	0.52	0.67	0.72	0.08
Control Delay	10.4	20.9	31.8	3.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.4	20.9	31.8	3.1
Queue Length 50th (ft)	3	118	83	7
Queue Length 95th (ft)	46	#260	#192	24
Internal Link Dist (ft)	429	6529		184
Turn Bay Length (ft)	495		85	
Base Capacity (vph)	658	713	429	1322
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.67	0.69	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	93	105	346	142	74	321	414	309	37	278
v/c Ratio	0.38	0.43	0.67	0.52	0.26	0.74	0.53	0.38	0.33	0.46
Control Delay	31.9	33.1	10.7	34.6	22.9	39.4	19.8	3.9	42.8	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	33.1	10.7	34.6	22.9	39.4	19.8	3.9	42.8	26.3
Queue Length 50th (ft)	32	36	0	49	17	110	127	0	14	48
Queue Length 95th (ft)	77	85	45	110	53	#287	229	33	46	85
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	736	734	867	787	763	431	952	912	113	1118
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.14	0.40	0.18	0.10	0.74	0.43	0.34	0.33	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	114	313	23	625	136	460	534
v/c Ratio	0.16	0.51	0.41	0.17	0.83	0.20	0.82	0.39
Control Delay	25.4	41.0	9.4	41.8	34.3	6.7	40.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	41.0	9.4	41.8	34.3	6.7	40.3	7.2
Queue Length 50th (ft)	13	56	57	12	286	8	222	73
Queue Length 95th (ft)	39	105	105	36	#504	44	#407	219
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	453	381	844	145	920	790	672	1384
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.30	0.37	0.16	0.68	0.17	0.68	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	112	51	56	135	309	792	34	185	596
v/c Ratio	1.30	0.09	0.28	0.60	0.84	0.57	0.29	0.48	0.74
Control Delay	233.6	0.3	40.6	41.2	55.8	22.8	48.3	34.8	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	233.6	0.3	40.6	41.2	55.8	22.8	48.3	34.8	9.0
Queue Length 50th (ft)	~87	0	30	58	171	180	19	90	0
Queue Length 95th (ft)	#201	0	66	115	#325	260	51	161	89
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	86	543	379	401	409	1501	133	479	858
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.09	0.15	0.34	0.76	0.53	0.26	0.39	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	234	239	516	181	37	149	761	532	43	777	43
v/c Ratio	0.47	0.56	0.51	0.92	0.31	0.06	0.90	0.60	0.49	0.40	0.78	0.06
Control Delay	46.0	34.7	14.8	60.0	25.7	0.2	90.7	25.8	5.7	51.4	35.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	34.7	14.8	60.0	25.7	0.2	90.7	25.8	5.7	51.4	35.0	0.8
Queue Length 50th (ft)	43	111	37	142	78	0	81	184	44	23	199	0
Queue Length 95th (ft)	92	182	103	#256	134	0	#205	267	130	58	#287	5
Internal Link Dist (ft)		429			1915			582			6350	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	209	540	561	561	626	628	165	1273	1086	108	1034	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.43	0.43	0.92	0.29	0.06	0.90	0.60	0.49	0.40	0.75	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	281	120	83	1597	245	1256
v/c Ratio	0.80	0.46	0.29	0.86	0.88	0.34
Control Delay	36.1	39.9	11.0	23.8	67.2	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	39.9	11.0	23.8	67.2	4.1
Queue Length 50th (ft)	76	62	0	391	135	72
Queue Length 95th (ft)	#191	115	39	#530	#264	93
Internal Link Dist (ft)				226		582
Turn Bay Length (ft)		100			170	
Base Capacity (vph)	398	319	327	1907	311	3990
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.38	0.25	0.84	0.79	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	292	21	219	146	31	68	219	1256	104	1177	198
v/c Ratio	0.74	0.08	0.38	0.57	0.21	0.27	0.72	0.61	0.54	0.68	0.30
Control Delay	46.2	36.5	7.7	44.9	43.0	2.6	50.7	21.9	50.0	26.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	46.2	36.5	7.7	44.9	43.0	2.6	50.7	22.0	50.0	26.8	4.5
Queue Length 50th (ft)	158	10	0	79	17	0	120	200	57	204	0
Queue Length 95th (ft)	#301	34	36	138	45	2	#244	257	113	260	44
Internal Link Dist (ft)		707			453			403		597	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	395	677	1171	366	619	654	305	2271	209	2006	741
Starvation Cap Reductn	0	0	0	0	0	0	0	111	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.03	0.19	0.40	0.05	0.10	0.72	0.58	0.50	0.59	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	1135	184	160	417	1333	250	1490	26
v/c Ratio	1.12	0.61	0.93	0.38	0.34	0.98	0.47	0.25	1.05	0.05
Control Delay	196.3	28.9	54.7	38.6	15.3	84.6	20.0	2.9	81.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	0.0
Total Delay	196.3	28.9	54.7	38.6	15.3	84.6	20.0	2.9	101.5	0.2
Queue Length 50th (ft)	~80	114	465	126	36	~375	291	15	~498	0
Queue Length 95th (ft)	#190	223	547	193	96	m#599	m336	m27	#595	0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	74	494	1304	523	503	426	2851	988	1425	534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	65	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.61	0.87	0.35	0.32	0.98	0.47	0.25	1.10	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	577	294	88	129	356	1392	103	448	1026	242
v/c Ratio	0.71	0.75	0.32	0.80	1.01	0.47	0.12	0.79	0.43	0.21
Control Delay	50.4	68.0	6.8	90.7	88.5	24.3	1.4	50.5	4.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	50.4	68.0	6.8	90.7	88.5	24.9	1.4	50.5	4.9	0.5
Queue Length 50th (ft)	228	128	0	107	215	245	0	185	66	0
Queue Length 95th (ft)	277	172	26	#194	#443	277	14	m212	m178	m8
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	867	1143	580	186	364	2941	851	597	2388	1135
Starvation Cap Reductn	0	0	0	0	0	1019	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.26	0.15	0.69	0.98	0.72	0.12	0.75	0.43	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	177	73	25	104	48	1307	1229	209
v/c Ratio	0.65	0.24	0.21	0.44	0.31	0.32	0.63	0.23
Control Delay	46.5	13.3	42.3	11.1	42.9	8.5	20.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Total Delay	46.5	13.3	42.3	11.1	42.9	8.5	20.9	7.6
Queue Length 50th (ft)	95	6	14	0	26	93	282	25
Queue Length 95th (ft)	155	42	38	34	59	137	#478	78
Internal Link Dist (ft)		235	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	354	374	307	403	156	4066	1940	925
Starvation Cap Reductn	0	0	0	0	0	0	393	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.20	0.08	0.26	0.31	0.32	0.79	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	253	108	515	77	211	5	531	1084	180	119	871	263
v/c Ratio	0.96	0.23	0.66	0.44	0.73	0.01	0.98	0.48	0.23	0.67	0.97	0.50
Control Delay	103.0	41.8	7.6	71.7	69.9	0.0	81.7	28.4	11.0	77.1	72.7	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.4	0.2
Total Delay	103.0	41.8	7.6	71.7	69.9	0.0	81.7	28.4	11.0	77.1	114.2	20.8
Queue Length 50th (ft)	224	77	0	34	180	0	464	243	34	102	401	73
Queue Length 95th (ft)	#427	129	94	64	267	0	#759	332	95	173	#585	172
Internal Link Dist (ft)		2096			372			407			363	
Turn Bay Length (ft)	130		75	265		150	150		45	220		200
Base Capacity (vph)	264	666	901	181	490	528	541	2272	777	237	902	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	115	24
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.16	0.57	0.43	0.43	0.01	0.98	0.48	0.23	0.50	1.11	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	98	54	38	1707	1603
v/c Ratio	0.21	0.20	0.21	0.66	0.49
Control Delay	20.7	8.6	23.9	6.8	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	8.6	23.9	6.8	7.8
Queue Length 50th (ft)	14	0	11	134	65
Queue Length 95th (ft)	28	23	32	221	176
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1246	626	182	2604	3296
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.09	0.21	0.66	0.49

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	182	297	333	83	365	276	1380	240	1109	130
v/c Ratio	0.71	0.40	0.61	0.83	0.67	0.62	0.95	0.96	0.51	0.18
Control Delay	59.0	37.5	12.6	105.7	28.0	51.1	45.4	95.2	24.7	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	37.5	12.6	105.7	28.0	51.1	45.4	95.2	24.7	3.8
Queue Length 50th (ft)	119	92	32	57	60	92	468	165	204	0
Queue Length 95th (ft)	201	132	116	#160	113	146	#714	#354	281	33
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	333	1034	652	100	673	476	1456	250	2154	725
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.29	0.51	0.83	0.54	0.58	0.95	0.96	0.51	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	192	159	82	27	154	736	27	560	99
v/c Ratio	0.62	0.34	0.25	0.06	0.61	0.73	0.21	0.75	0.14
Control Delay	32.6	6.2	23.5	0.2	41.1	19.5	36.1	25.1	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	6.2	23.5	0.2	41.1	19.5	36.1	25.1	2.2
Queue Length 50th (ft)	74	0	29	0	62	161	11	183	0
Queue Length 95th (ft)	136	40	63	0	#155	#547	37	#368	17
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	561	721	591	735	270	1039	131	879	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.22	0.14	0.04	0.57	0.71	0.21	0.64	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	59	202	284	290	154	16	612	553	165	580
v/c Ratio	0.28	0.46	0.67	0.68	0.30	0.18	0.59	0.74	0.94	0.40
Control Delay	39.0	32.4	36.4	36.9	6.2	46.7	27.9	14.4	95.7	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	32.4	36.4	36.9	6.2	46.7	27.9	14.4	95.7	19.8
Queue Length 50th (ft)	29	43	140	143	0	8	138	58	87	98
Queue Length 95th (ft)	70	83	240	245	44	31	223	208	#243	195
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	642	1257	604	606	661	91	1225	814	176	1483
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.16	0.47	0.48	0.23	0.18	0.50	0.68	0.94	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	335	804	27	537	548	53	48	222	225	218
v/c Ratio	1.04	0.49	0.22	0.56	0.68	0.34	0.28	0.60	0.60	0.43
Control Delay	96.9	18.5	44.2	28.6	7.4	45.0	27.1	35.9	36.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.9	18.5	44.2	28.6	7.4	45.0	27.1	35.9	36.0	6.7
Queue Length 50th (ft)	~188	127	13	122	0	26	10	107	108	0
Queue Length 95th (ft)	#419	263	43	195	86	69	47	189	191	52
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	323	1659	126	1205	873	157	172	678	682	754
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.48	0.21	0.45	0.63	0.34	0.28	0.33	0.33	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	763	495	468	942	47	205
v/c Ratio	0.51	0.53	0.84	0.33	0.28	0.70
Control Delay	23.1	4.8	41.7	3.1	40.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	4.8	41.7	3.1	40.3	23.9
Queue Length 50th (ft)	161	0	243	50	26	26
Queue Length 95th (ft)	280	77	323	109	54	89
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1485	941	598	2837	443	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.53	0.78	0.33	0.11	0.39

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	228	628	950	111	346	334	315
v/c Ratio	0.78	0.30	0.77	0.17	0.80	0.76	0.55
Control Delay	42.8	6.5	21.8	4.2	35.4	28.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	6.5	21.8	4.2	35.4	28.0	8.9
Queue Length 50th (ft)	72	48	145	0	108	85	16
Queue Length 95th (ft)	#164	73	#237	26	#230	#207	75
Internal Link Dist (ft)		595	411			642	
Turn Bay Length (ft)	170				455		455
Base Capacity (vph)	308	2079	1240	643	451	458	581
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.30	0.77	0.17	0.77	0.73	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	65	995	43	772	266	60
v/c Ratio	0.27	0.44	0.19	0.38	0.55	0.12
Control Delay	24.3	9.8	23.9	12.2	19.9	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	9.8	23.9	12.2	19.9	1.7
Queue Length 50th (ft)	16	42	11	59	62	0
Queue Length 95th (ft)	52	119	39	103	128	9
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	245	2452	228	2296	878	842
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.41	0.19	0.34	0.30	0.07

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	375	228	277	43	945	158	456
v/c Ratio	0.71	0.95	0.90	0.63	0.36	0.96	0.45	0.31
Control Delay	57.4	70.6	76.0	36.4	48.2	47.4	36.3	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	70.6	76.0	36.4	48.2	47.4	36.3	16.0
Queue Length 50th (ft)	84	203	129	133	24	219	80	79
Queue Length 95th (ft)	#166	#378	#263	218	57	#352	140	118
Internal Link Dist (ft)		705		2096		773		773
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	226	393	253	437	126	982	354	1453
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.95	0.90	0.63	0.34	0.96	0.45	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	32	805	26	590	100	31	61	59
v/c Ratio	0.16	0.34	0.13	0.25	0.26	0.09	0.28	0.16
Control Delay	31.8	14.4	31.7	14.2	20.4	10.0	22.0	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	14.4	31.7	14.2	20.4	10.0	22.0	0.9
Queue Length 50th (ft)	8	51	6	36	22	1	7	0
Queue Length 95th (ft)	45	163	39	120	71	20	56	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	199	2897	199	2921	1193	1045	245	401
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.28	0.13	0.20	0.08	0.03	0.25	0.15

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	6	420	765	420	185	1247	450	6	25
v/c Ratio	0.12	1.25	1.00	1.47	0.28	1.38	0.45	0.10	0.33
Control Delay	75.2	181.1	45.6	273.4	35.5	208.7	3.5	73.8	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	181.1	45.6	273.4	35.5	208.7	3.5	73.8	45.0
Queue Length 50th (ft)	6	~519	~239	~571	126	~1637	6	6	6
Queue Length 95th (ft)	21	#628	#349	#680	187	#1625	32	21	34
Internal Link Dist (ft)		684			870		8220		1542
Turn Bay Length (ft)	250		520	360				200	
Base Capacity (vph)	52	337	767	285	656	903	1007	62	76
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	1.25	1.00	1.47	0.28	1.38	0.45	0.10	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

27: Sierra College Boulevard/Sierra College Blvd & English Colony Way

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	312	1208	188	995
v/c Ratio	0.66	0.77	0.67	0.41
Control Delay	12.1	18.4	38.3	4.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.1	18.4	38.3	4.6
Queue Length 50th (ft)	10	166	62	49
Queue Length 95th (ft)	69	297	#165	122
Internal Link Dist (ft)	845	10454		2201
Turn Bay Length (ft)	1450		100	
Base Capacity (vph)	719	1716	297	2615
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.43	0.70	0.63	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	615	328	139	180	549	25	303	172
v/c Ratio	0.96	0.49	0.65	0.80	0.85	0.31	0.69	0.36
Control Delay	63.4	19.6	61.1	75.6	49.4	65.5	49.9	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	19.6	61.1	75.6	49.4	65.5	49.9	12.7
Queue Length 50th (ft)	447	108	97	132	391	18	208	21
Queue Length 95th (ft)	361	95	105	141	326	33	199	25
Internal Link Dist (ft)	422		500		2517		526	
Turn Bay Length (ft)		30		150		140		115
Base Capacity (vph)	643	665	283	237	646	80	440	474
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.49	0.49	0.76	0.85	0.31	0.69	0.36

Intersection Summary

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	321	266	158
v/c Ratio	0.37	0.43	0.70	0.12
Control Delay	9.0	13.7	31.0	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.0	13.7	31.0	3.2
Queue Length 50th (ft)	1	63	68	10
Queue Length 95th (ft)	35	132	#170	30
Internal Link Dist (ft)	429	6529		184
Turn Bay Length (ft)	495		85	
Base Capacity (vph)	688	749	386	1369
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.43	0.69	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Cumulative Conditions – Long Term Plus Project

Project Driveway Option A

Cumulative Long-Term Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	200	970	350	280	490	-	65	215	150	95	585	-
2	Taylor Road & Horseshoe Bar Road	100	400	125	190	380	-	-	115	-	-	160	160
3	Horseshoe Bar Road & I-80 Westbound Ramp	85	680	-	160	450	95	-	935	250	275	95	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	2,350	100	-	685	-	-	-	-	-	1,080	-
5	Barton Road & Brace Road	-	2,895	-	-	-	-	-	1,980	-	-	560	-
6	Sierra College Boulevard & Taylor Road	210	550	550	210	1,500	450	150	900	250	215	2,060	215
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	60	230	150
9	Sierra College Boulevard & I-80 WB Ramps	200	1,530	325	-	370	150	530	-	530	740	1,320	740
10	Sierra College Boulevard & I-80 EB Ramps	-	710	280	250	1,530	500	1,315	1,315	205	345	-	330
11	Sierra College Boulevard & Schriber Way	90	395	-	-	300	100	200	200	-	-	415	415
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	150	1,675	45	220	710	200	130	2,000	75	265	745	150
13	Sierra College Boulevard & Stadium Dwy	200	1,580	-	-	1,690	-	200	-	60	-	-	-
14	Sierra College Boulevard & Rocklin Road	245	650	-	245	1,575	175	240	925	925	315	1,325	-
15	Pacific Street & Dominguez Road/Delmar Avenue	210	1,860	-	200	850	150	-	700	315	-	1,935	140
16	Pacific Street & Rocklin Road	265	420	110	230	410	-	130	285	-	250	330	330
17	Granite Drive & Rocklin Road	100	140	-	325	625	625	225	675	-	135	650	150
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	635	1,165	-	-	580	280	300	555	-
19	I-80 Eastbound Ramps & Rocklin Road	455	1,115	455	-	-	-	170	520	-	-	370	-
20	Aguilar Road & Rocklin Road	320	-	320	-	-	-	75	400	-	85	1,260	-
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
22	Dominguez Road & Granite Driive	200	1,390	-	200	730	-	200	370	-	200	2,000	-
23	El Don Drive & Rocklin Road	140	530	-	-	580	95	410	1,260	-	265	1,430	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	900	900	-	200	800	-	250	1900	520	360	2500	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	4,500	-	100	1,300	-	-	-	-	1,450	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	105	1,100	-	105	3,100	-	-	85	30	-	910	30
29	Taylor Road & English Colony Way-Rock Springs Road	150	1,900	-	140	350	115	-	560	30	-	940	-
30	Taylor Road & Penryn Road (North	85	170	-	-	555	-	55	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	2,600	-	85	180	-	-	-	-	495	-	-
32	Taylor Road & Del Oro High School North Lot	-	185	-	70	1,600	-	-	-	-	200	-	45
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Drop Off	150	300	-	90	190	-	-	50	-	-	75	-
34	Taylor Road & Del Oro High School South Lot	-	1,200	-	150	300	-	-	-	-	65	-	65
35	Taylor Road & Rippey Road	140	465	-	-	610	-	3,500	-	-	-	-	-
36	Taylor Road & Webb Street	0	150	0	0	0	0	0	0	0	150	0	0
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative-Long TermP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#419**	530	35	#141	**#530**	-	**206**	170	102	**300**	#485	-
2	Taylor Road & Horseshoe Bar Road	-	**#443**	-	**#495**	289	-	-	75	-	-	19	**169**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**#308**	183	-	49	97	**108**	-	71	7	46	81	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	3	-	-	-	-	-	685	-
5	Barton Road & Brace Road	-	20	-	-	-	-	-	-	-	-	8	-
6	Sierra College Boulevard & Taylor Road	**#440**	284	28	113	#1022	128	**#198**	171	-	**#391**	#561	5
7	Sierra College Boulevard & Brace Road	-	138	-	#74	288	-	-	-	-	**#212**	-	38
8	Sierra College Boulevard & Granite Drive	**438**	**435**	41	134	**#976**	107	125	30	38	**231**	60	-
9	Sierra College Boulevard & I-80 WB Ramps	m#152	130	-	-	**#980**	8	20	-	35	429	226	196
10	Sierra College Boulevard & I-80 EB Ramps	-	300	-	m141	#1356	m27	285	73	**#574**	42	-	-
11	Sierra College Boulevard & Schriber Way	**115**	119	-	-	**#1619**	90	**#213**	55	-	-	49	53
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	**#551**	243	28	104	**#1445**	154	**#293**	64	**138**	83	173	-
13	Sierra College Boulevard & Stadium Dwy	**#275**	128	-	-	682	-	39	-	20	-	-	-
14	Sierra College Boulevard & Rocklin Road	**#334**	#598	-	**#254**	345	97	#164	250	72	**#318**	243	-
15	Pacific Street & Dominguez Road/Delmar Avenue	**#390**	358	-	90	#736	34	-	77	47	-	#525	12
16	Pacific Street & Rocklin Road	100	373	**#904**	**#488**	330	-	61	81	-	**#746**	**#773**	117
17	Granite Drive & Rocklin Road	37	29	-	184	183	47	#202	#471	-	31	#571	**251**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	91	#379	-	-	#374	64	**#353**	268	-
19	I-80 Eastbound Ramps & Rocklin Road	**476**	#883	**#811**	-	-	-	**#303**	304	-	-	**#556**	37
20	Aguilar Road & Rocklin Road	#270	-	29	-	-	-	62	**#503**	-	45	114	-
21	Sierra College Boulevard & Driveway South of Brace Road	20	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	#90	42	-	#133	158	-	#155	192	-	**#207**	#452	-
23	El Don Drive & Rocklin Road	**189**	35	-	-	#76	-	**#965**	344	-	28	228	-
24	Sierra College Boulevard & Project Driveway	#121	110	17	63	**385**	-	24	-	-	#80	-	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	#761	-	-	21	-	-	-	258	**#924**	**#745**	316	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	154	-	**#215**	379	-	-	-	-	56	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	-	99	-	15	460	-	-	11	-	-	116	**63**
29	Taylor Road & English Colony Way-Rock Springs Road	**#205**	165	-	25	**#668**	**136**	-	118	**36**	-	184	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	5	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	172	-	**148**	**303**	-	-	-	-	65	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	35	-	-	-	-	-	**280**	-	13
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dr	-	-	-	15	-	-	-	-	-	-	**900**	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	20	-	-	-	-	-	**333**	-	18
35	Taylor Road & Rippey Road	10	-	-	-	-	-	23	-	-	-	-	-
36	Taylor Road & Webb Street	13	-	-	3	-	-	-	-	220	-	85	-
37	Project Driveway East & Brace Road	-	0	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#544**	381	58	103	189	-	**112**	**277**	149	**119**	135	-
2	Taylor Road & Horseshoe Bar Road	49	**#1040**	59	**#788**	360	-	-	96	-	-	128	**373**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**207**	356	-	69	186	**100**	-	#196	6	97	92	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	15	-	-	-	-	-	**2035**	-
5	Barton Road & Brace Road	-	75	-	-	-	-	-	-	-	-	5	-
6	Sierra College Boulevard & Taylor Road	**#266**	**#874**	309	#88	482	14	**190**	#500	200	**#380**	242	1
7	Sierra College Boulevard & Brace Road	-	**#842**	140	**#525**	280	-	-	-	**#768**	**#224**	-	46
8	Sierra College Boulevard & Granite Drive	**285**	**#1604**	27	153	**#829**	146	**#699**	51	46	**177**	63	57
9	Sierra College Boulevard & I-80 WB Ramps	**m#523**	m599	m42	-	**#1091**	-	#88	-	59	#628	283	208
10	Sierra College Boulevard & I-80 EB Ramps	-	504	45	m#153	m294	-	#393	128	53	#257	-	**#517**
11	Sierra College Boulevard & Schriber Way	82	363	-	-	**#833**	87	183	50	-	-	53	31
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	**#575**	#1056	**102**	**#243**	**#1122**	22	**#438**	83	**#498**	#150	145	-
13	Sierra College Boulevard & Stadium Dwy	80	#1048	-	-	425	-	130	-	**77**	-	-	-
14	Sierra College Boulevard & Rocklin Road	**#345**	**#1675**	-	**#656**	620	136	**#657**	194	#779	#243	241	-
15	Pacific Street & Dominguez Road/Delmar Avenue	**242**	**#2118**	-	#127	632	-	-	#605	**93**	-	#498	23
16	Pacific Street & Rocklin Road	97	**423**	**#964**	**#389**	**465**	-	114	188	-	**#823**	**#840**	173
17	Granite Drive & Rocklin Road	83	48	-	254	255	61	**#452**	479	-	#61	#614	**#380**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	108	#468	-	-	**#708**	**277**	**#878**	283	-
19	I-80 Eastbound Ramps & Rocklin Road	**#465**	#356	#266	-	-	-	**#403**	156	-	-	**#738**	42
20	Aguilar Road & Rocklin Road	135	-	9	-	-	-	51	#255	-	53	#288	-
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	8	-	-	-
22	Dominguez Road & Granite Driive	61	#314	-	**#212**	112	-	#90	**#424**	-	**#202**	203	-
23	El Don Drive & Rocklin Road	89	23	-	-	#331	#93	#253	213	-	45	260	-
24	Sierra College Boulevard & Project Driveway	78	**#678**	80	**#240**	**449**	-	138	23	-	**#261**	58	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	**#1773**	48	-	-	-	-	20	#769	#487	**#393**	431	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	#1157	-	**#388**	156	-	-	-	-	#191	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	5	521	-	17	165	-	-	19	4	-	53	11
29	Taylor Road & English Colony Way-Rock Springs Road	120	#448	-	29	167	28	-	#361	**64**	-	91	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	#270	-	**#193**	25	-	-	-	-	47	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	23	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dr	-	-	-	-	-	-	-	-	-	-	13	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	50	-	8
35	Taylor Road & Rippey Road	3	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	25	-	-	-	-	-	-	-	43	-	3	-
37	Project Driveway East & Brace Road	-	3	-	-	-	-	-	-	-	0	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Taylor Road & King Road	**#309**	249	33	46	94	-	**78**	86	45	**117**	54	-
2	Taylor Road & Horseshoe Bar Road	36	**#569**	44	**#407**	250	-	-	39	-	-	105	**113**
3	Horseshoe Bar Road & I-80 Westbound Ramp	**#325**	260	-	51	161	89	-	#201	-	66	**115**	-
4	Horseshoe Bar Road & I-80 Eastbound Ramp	-	-	-	-	10	-	-	-	-	-	**1405**	-
5	Barton Road & Brace Road	-	228	-	-	-	-	-	-	-	-	8	-
6	Sierra College Boulevard & Taylor Road	**#267**	284	165	58	#330	5	92	182	139	**#291**	134	-
7	Sierra College Boulevard & Brace Road	-	231	29	**#223**	123	-	-	-	#164	**#118**	-	23
8	Sierra College Boulevard & Granite Drive	**266**	**#903**	49	148	**530**	142	**#410**	43	41	**192**	61	30
9	Sierra College Boulevard & I-80 WB Ramps	**m#596**	m393	m27	-	**#846**	-	#190	-	223	547	308	220
10	Sierra College Boulevard & I-80 EB Ramps	-	292	14	m198	m194	m14	345	172	26	#194	-	**#443**
11	Sierra College Boulevard & Schriber Way	59	145	-	-	**#516**	78	155	42	-	-	38	34
12	Sierra College Boulevard & Bass Pro Drive/Dominguez Road	**#759**	354	**95**	173	#645	182	**#427**	129	**94**	64	267	-
13	Sierra College Boulevard & Stadium Dwy	32	240	-	-	186	-	28	-	23	-	-	-
14	Sierra College Boulevard & Rocklin Road	146	**#749**	-	**#366**	293	41	216	132	118	#160	114	-
15	Pacific Street & Dominguez Road/Delmar Avenue	#155	#598	-	37	#435	17	-	136	40	-	63	-
16	Pacific Street & Rocklin Road	31	232	**228**	**#244**	211	-	90	83	-	**247**	249	44
17	Granite Drive & Rocklin Road	69	47	-	189	191	55	**#448**	263	-	43	195	**86**
18	I-80 Westbound Ramps & Rocklin Road	-	-	-	54	89	-	-	280	77	**323**	109	-
19	I-80 Eastbound Ramps & Rocklin Road	#230	#207	75	-	-	-	#164	73	-	-	#237	26
20	Aguilar Road & Rocklin Road	128	-	10	-	-	-	52	119	-	42	103	-
21	Sierra College Boulevard & Driveway South of Brace Road	5	-	-	-	-	-	-	-	-	-	-	-
22	Dominguez Road & Granite Driive	57	#368	-	140	126	-	#166	**#378**	-	**#263**	218	-
23	El Don Drive & Rocklin Road	71	22	-	-	56	-	45	164	-	46	121	-
24	Sierra College Boulevard & Project Driveway	#73	302	46	**#246**	266	-	97	2	-	**#221**	45	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	**#1658**	32	-	21	34	-	21	#628	#362	**#701**	187	-
27	Sierra College Boulevard/Sierra College Blvd & English Colony Way	-	#328	-	**#167**	129	-	-	-	-	72	-	-
28	Sierra College Boulevard/Sierra College Blvd & Delmar Avenue	3	144	-	58	154	-	-	14	2	-	39	2
29	Taylor Road & English Colony Way-Rock Springs Road	145	335	-	33	207	25	-	361	**97**	-	105	-
30	Taylor Road & Penryn Road (North	3	-	-	-	-	-	3	-	-	-	-	-
31	Taylor Road & Penryn Road (South)	-	140	-	**#171**	32	-	-	-	-	37	-	-
32	Taylor Road & Del Oro High School North Lot	-	-	-	-	-	-	-	-	-	3	-	-
33	Taylor Road & First Baptist Church Driveway/Del Oro High School Dr	-	-	-	3	-	-	-	-	-	-	43	-
34	Taylor Road & Del Oro High School South Lot	-	-	-	3	-	-	-	-	-	48	-	8
35	Taylor Road & Rippey Road	5	-	-	-	-	-	5	-	-	-	-	-
36	Taylor Road & Webb Street	15	-	-	-	-	-	-	-	93	-	155	-
37	Project Driveway East & Brace Road	-	5	-	-	-	-	-	-	-	3	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	0.78%	0.62%	1.04%	0.00%	0.49%	0.00%	0.00%	0.00%	0.65%	0.42%	0.00%	0.00%
2	-	1.44%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	2.17%	-	0.00%	-	-	-	-	1.16%	6.25%	0.00%	0.26%	-
6	3.08%	1.05%	3.30%	0.00%	0.47%	0.00%	0.00%	0.00%	8.54%	1.50%	0.00%	0.00%
7	-	2.21%	0.00%	0.00%	1.12%	0.00%	-	-	0.00%	0.00%	-	0.90%
8	0.00%	11.56%	0.00%	0.00%	5.90%	2.03%	4.11%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	5.26%	0.00%	-	5.27%	0.00%	0.00%	-	0.00%	0.00%	0.00%	15.42%
10	-	0.85%	0.00%	0.00%	0.50%	26.41%	8.35%	0.00%	0.00%	0.00%	-	0.00%
11	0.00%	0.99%	0.00%	-	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12	0.00%	1.05%	0.00%	0.00%	0.49%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
13	0.00%	0.82%	-	-	0.57%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	0.70%	0.00%	0.66%	0.60%	0.65%	1.87%	0.00%	0.00%	0.00%	0.00%	0.34%
15	0.00%	2.40%	0.00%	0.00%	1.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	0.57%	0.25%	0.00%	0.62%	16.67%	13.79%	0.00%	0.00%	0.27%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	1.55%	2.17%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	-	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	1.41%	-	-	-	0.00%	0.00%	0.00%	3.23%	0.00%	-
21	0.00%	2.15%	-	-	0.97%	0.00%	-	-	-	-	-	-
22	0.00%	3.23%	0.00%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
23	0.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.08%	0.00%	9.09%	0.19%	0.00%
24	0.00%	-4.24%	100.00%	100.00%	-1.59%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.00%	-	-	0.39%	-
26	0.63%	-	1.16%	0.00%	-	0.00%	-	0.00%	0.31%	0.23%	0.00%	-
27	-	1.02%	9.09%	0.00%	0.32%	-	-	-	-	16.67%	-	0.00%
28	-	0.92%	9.09%	0.00%	0.34%	0.00%	0.00%	-	-	0.74%	0.00%	0.00%
29	0.79%	0.49%	0.00%	0.00%	0.16%	0.00%	0.00%	0.00%	0.86%	0.00%	0.00%	0.00%
30	0.00%	0.59%	-	-	0.21%	-	-	-	0.00%	-	-	-
31	-	0.76%	2.17%	0.00%	0.26%	-	-	-	-	1.96%	-	0.00%
32	-	1.08%	0.00%	0.00%	0.28%	-	-	-	-	0.00%	-	0.00%
33	0.00%	0.90%	0.00%	0.00%	0.30%	0.00%	-	-	0.00%	0.00%	-	0.00%
34	-	0.74%	0.00%	0.00%	0.29%	-	-	-	-	0.00%	-	0.00%
35	1.79%	0.28%	-	-	0.24%	-	0.00%	-	2.63%	-	-	-
36	1.16%	0.68%	0.00%	0.00%	0.55%	0.00%	-	-	0.45%	0.00%	-	0.00%
37	100.00%	-	100.00%	-	-	-	-	0.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Long TermP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	1.44%	2.53%	1.23%	0.00%	3.64%	0.00%	0.00%	0.00%	1.21%	4.76%	0.00%	0.00%
2	0.00%	3.08%	0.00%	0.00%	3.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	5.41%	-	0.00%	-	-	-	-	0.68%	3.23%	0.00%	2.17%	-
6	13.91%	1.34%	4.18%	0.00%	1.98%	0.00%	0.00%	0.00%	7.69%	4.62%	0.00%	0.00%
7	-	2.94%	0.00%	2.17%	4.30%	0.00%	-	-	0.00%	0.00%	0.00%	2.26%
8	0.00%	13.26%	0.00%	0.00%	16.17%	4.64%	2.12%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	6.76%	0.00%	-	13.49%	0.00%	0.00%	-	0.00%	0.00%	0.00%	38.78%
10	-	1.18%	0.00%	0.00%	1.93%	30.90%	16.67%	0.00%	0.00%	0.00%	-	0.00%
11	0.00%	1.21%	0.00%	-	1.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12	0.00%	1.27%	0.00%	0.00%	2.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
13	0.00%	1.18%	-	-	1.52%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	0.96%	0.00%	1.22%	1.23%	2.60%	1.79%	0.00%	0.00%	0.00%	0.00%	1.87%
15	0.00%	1.90%	0.00%	0.00%	3.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	1.29%	0.71%	0.00%	1.32%	26.83%	14.29%	0.00%	0.00%	0.72%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	3.47%	2.74%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	3.51%	-	-	-	0.00%	0.00%	0.00%	3.51%	0.00%	-
21	0.00%	2.50%	-	-	2.92%	0.00%	-	-	0.00%	-	-	-
22	0.00%	1.72%	0.00%	0.00%	3.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
23	0.00%	0.00%	10.26%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	13.79%	0.20%	0.00%
24	0.00%	-4.18%	100.00%	100.00%	-4.95%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	1.29%	-
26	0.65%	-	1.13%	-	-	-	0.00%	0.00%	1.25%	2.06%	0.00%	-
27	-	0.80%	11.76%	0.00%	1.45%	-	-	-	-	11.76%	-	0.00%
28	0.00%	1.00%	0.52%	0.00%	1.28%	0.00%	0.00%	0.00%	0.00%	5.41%	0.00%	0.00%
29	1.71%	1.04%	0.00%	0.00%	2.12%	0.00%	0.00%	0.00%	1.07%	0.00%	0.00%	0.00%
30	0.00%	1.13%	-	-	1.71%	0.00%	-	-	0.00%	-	-	-
31	-	1.50%	7.41%	0.00%	5.94%	-	-	-	-	16.67%	-	0.00%
32	-	2.27%	0.00%	-	2.99%	-	-	-	-	0.00%	-	-
33	-	2.19%	0.00%	0.00%	2.47%	-	-	-	-	0.00%	-	0.00%
34	-	2.18%	0.00%	0.00%	2.47%	-	-	-	-	0.00%	-	0.00%
35	8.00%	1.60%	-	-	2.26%	0.00%	0.00%	-	6.45%	-	-	-
36	2.30%	1.79%	-	-	2.33%	0.00%	-	-	3.36%	-	-	0.00%
37	100.00%	-	100.00%	-	-	-	-	0.43%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Long TermP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	4.06%	5.37%	3.10%	0.00%	9.30%	0.00%	0.00%	0.00%	4.11%	6.50%	0.00%	0.00%
2	0.00%	7.72%	0.00%	0.00%	9.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	-	0.00%	0.00%	0.00%	0.00%	-	-	-	-	0.00%	-	0.00%
5	5.41%	-	0.00%	-	-	-	-	1.81%	1.91%	0.00%	7.77%	-
6	21.79%	5.05%	8.42%	0.00%	5.07%	0.00%	0.00%	0.00%	15.41%	9.01%	0.00%	0.00%
7	-	8.54%	0.00%	6.00%	9.43%	0.00%	-	-	0.00%	0.00%	-	6.98%
8	0.00%	26.02%	0.00%	0.00%	25.07%	8.21%	6.04%	0.00%	0.00%	0.00%	0.00%	0.00%
9	0.00%	12.15%	0.00%	-	20.91%	0.00%	0.00%	-	0.00%	0.00%	0.00%	54.66%
10	-	4.19%	0.00%	0.00%	5.33%	46.83%	17.53%	0.00%	0.00%	0.00%	-	0.00%
11	0.00%	4.76%	0.00%	-	4.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12	0.00%	5.32%	0.00%	0.00%	6.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
13	0.00%	3.62%	-	-	3.83%	0.00%	0.00%	-	0.00%	-	-	-
14	0.00%	3.10%	0.00%	2.95%	3.45%	8.09%	6.42%	0.00%	0.00%	0.00%	0.00%	4.26%
15	0.00%	6.45%	0.00%	0.00%	7.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
16	0.00%	3.52%	2.26%	0.00%	3.70%	44.44%	27.63%	0.00%	0.00%	2.34%	0.00%	0.00%
17	0.00%	0.00%	0.00%	0.00%	0.00%	7.66%	5.41%	0.00%	0.00%	0.00%	0.00%	0.00%
18	-	-	-	0.00%	0.00%	0.00%	-	0.00%	0.00%	0.00%	0.00%	-
19	0.00%	0.00%	0.00%	-	-	-	0.00%	0.00%	-	-	0.00%	0.00%
20	0.00%	-	6.78%	-	-	-	0.00%	0.00%	0.00%	9.09%	0.00%	-
21	0.00%	7.09%	-	-	7.15%	-	-	-	-	-	-	-
22	0.00%	3.73%	0.00%	0.00%	5.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
23	0.00%	0.00%	24.24%	0.00%	0.00%	0.00%	0.00%	0.58%	0.00%	21.88%	0.72%	0.00%
24	0.00%	-8.73%	100.00%	100.00%	-8.12%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	2.99%	-
26	1.46%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	0.00%	2.52%	2.30%	0.00%	0.00%
27	-	2.54%	28.57%	0.00%	3.14%	-	-	-	-	11.76%	-	0.00%
28	0.00%	3.44%	1.46%	0.00%	2.75%	0.00%	-	0.00%	0.00%	9.09%	-	0.00%
29	3.51%	2.73%	0.00%	0.00%	4.15%	0.00%	0.00%	0.00%	1.96%	0.00%	0.00%	0.00%
30	0.00%	2.99%	-	-	3.07%	0.00%	0.00%	-	0.00%	-	-	-
31	-	3.85%	16.67%	0.00%	7.64%	-	-	-	-	44.44%	-	0.00%
32	-	3.85%	0.00%	-	7.50%	-	-	-	-	0.00%	-	-
33	0.00%	3.93%	0.00%	0.00%	7.89%	-	-	-	0.00%	0.00%	-	0.00%
34	-	3.73%	0.00%	0.00%	6.86%	-	-	-	-	0.00%	-	0.00%
35	12.12%	3.30%	-	-	6.50%	0.00%	-	-	19.05%	-	-	-
36	9.09%	4.65%	0.00%	0.00%	6.15%	0.00%	-	-	5.37%	0.00%	0.00%	0.00%
37	100.00%	-	100.00%	-	-	-	-	1.15%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	184	149	353	271	385	295	555	110	80	934
v/c Ratio	0.71	0.58	0.72	0.67	0.92	0.95	0.73	0.16	0.70	0.96
Control Delay	63.4	56.5	15.8	52.1	70.9	89.3	38.1	5.3	87.1	61.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	56.5	15.8	52.1	70.9	89.3	38.1	5.3	87.1	61.6
Queue Length 50th (ft)	137	109	20	191	274	228	358	0	61	363
Queue Length 95th (ft)	206	170	102	300	#485	#419	530	35	#141	#530
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	409	403	586	405	418	311	760	675	120	975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.37	0.60	0.67	0.92	0.95	0.73	0.16	0.67	0.96

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	10	457	524	5	575	852
v/c Ratio	0.45	0.06	0.63	0.83	0.01	0.84	0.58
Control Delay	40.6	33.4	17.0	37.2	0.0	36.4	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	33.4	17.0	37.2	0.0	36.4	6.1
Queue Length 50th (ft)	34	5	143	238	0	264	132
Queue Length 95th (ft)	75	19	169	#443	0	#495	289
Internal Link Dist (ft)	142	528		1160			350
Turn Bay Length (ft)					125	190	
Base Capacity (vph)	328	426	787	731	661	755	1460
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.02	0.58	0.72	0.01	0.76	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	66	33	82	308	626	33	110	681
v/c Ratio	0.53	0.16	0.14	0.33	0.67	0.31	0.18	0.21	0.73
Control Delay	47.4	1.9	35.8	33.1	36.4	12.7	39.8	24.9	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	1.9	35.8	33.1	36.4	12.7	39.8	24.9	7.9
Queue Length 50th (ft)	27	0	15	30	131	67	15	39	0
Queue Length 95th (ft)	71	7	46	81	#308	183	49	97	108
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	252	774	618	612	671	2086	222	800	1059
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.09	0.05	0.13	0.46	0.30	0.15	0.14	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	117	87	497	378	69	241	710	226	64	1593	266
v/c Ratio	0.87	0.42	0.24	1.05	0.94	0.16	1.07	0.40	0.20	0.54	1.03	0.29
Control Delay	126.4	62.0	1.6	116.5	87.4	1.4	138.8	23.5	1.5	84.1	73.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.4	62.0	1.6	116.5	87.4	1.4	138.8	23.5	1.5	84.1	73.0	10.9
Queue Length 50th (ft)	89	104	0	~274	364	0	~261	227	0	61	~882	71
Queue Length 95th (ft)	#198	171	0	#391	#561	5	#440	284	28	113	#1022	128
Internal Link Dist (ft)		429			1915			582			5309	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	104	288	363	472	413	448	225	1772	1137	141	1542	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.41	0.24	1.05	0.92	0.15	1.07	0.40	0.20	0.45	1.03	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	314	236	914	27	85	2060
v/c Ratio	0.26	0.76	0.38	0.45	0.02	0.55	0.79
Control Delay	2.3	34.7	4.2	15.1	0.0	39.6	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	34.7	4.2	15.1	0.0	39.6	15.1
Queue Length 50th (ft)	0	105	0	101	0	30	223
Queue Length 95th (ft)	0	#212	38	138	0	#74	288
Internal Link Dist (ft)				219			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	267	463	736	2033	1247	188	2616
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.68	0.32	0.45	0.02	0.45	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	76	10	130	167	31	26	365	1054	94	83	2048	154
v/c Ratio	0.51	0.11	0.51	0.69	0.18	0.11	0.82	0.55	0.10	0.53	1.02	0.23
Control Delay	69.7	65.0	17.6	67.8	56.8	1.0	60.5	19.9	5.8	69.5	62.2	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.0	0.0	2.4	0.0
Total Delay	69.7	65.0	17.6	67.8	56.8	1.0	60.7	20.9	5.8	69.5	64.6	15.3
Queue Length 50th (ft)	60	8	0	129	23	0	277	269	9	65	~642	36
Queue Length 95th (ft)	125	30	38	231	60	0	438	435	41	134	#976	107
Internal Link Dist (ft)		707			562			403			599	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	394	418	687	394	415	430	613	2038	971	265	2017	675
Starvation Cap Reductn	0	0	0	0	0	0	30	662	0	0	15	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.02	0.19	0.42	0.07	0.06	0.63	0.77	0.10	0.31	1.02	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	71	799	252	245	87	1136	163	2392	54
v/c Ratio	0.08	0.39	0.89	0.55	0.54	0.65	0.35	0.16	0.94	0.06
Control Delay	71.2	17.9	64.4	31.3	25.9	87.0	7.2	0.6	39.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0
Total Delay	71.2	17.9	64.4	31.3	25.9	87.0	7.2	0.6	84.4	1.1
Queue Length 50th (ft)	5	6	378	123	95	72	155	5	765	0
Queue Length 95th (ft)	20	35	429	226	196	m#152	130	0	#980	8
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	61	184	1141	486	483	134	3231	999	2552	928
Starvation Cap Reductn	0	0	0	0	0	0	0	0	585	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.39	0.70	0.52	0.51	0.65	0.35	0.16	1.22	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	599	125	462	16	33	1277	38	239	2163	251
v/c Ratio	0.61	0.13	0.97	0.19	0.14	0.44	0.05	0.76	0.98	0.25
Control Delay	45.4	39.8	76.1	72.3	1.3	25.6	0.1	78.1	39.0	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Total Delay	45.4	39.8	76.1	72.3	1.3	26.5	0.1	78.1	39.0	1.6
Queue Length 50th (ft)	257	46	356	15	0	215	0	114	935	9
Queue Length 95th (ft)	285	73	#574	42	0	300	0	m141	#1356	m27
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	998	1008	500	84	261	2871	819	387	2207	1018
Starvation Cap Reductn	0	0	0	0	0	1207	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.12	0.92	0.19	0.13	0.77	0.05	0.62	0.98	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	141	76	21	76	65	1120	2440	201
v/c Ratio	0.76	0.33	0.22	0.55	0.45	0.24	1.11	0.19
Control Delay	89.7	18.3	72.5	28.1	76.0	6.0	83.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.9
Total Delay	89.7	18.3	72.5	28.1	76.0	6.3	83.6	8.7
Queue Length 50th (ft)	135	4	20	0	62	88	~1446	47
Queue Length 95th (ft)	#213	55	49	53	115	119	#1619	90
Internal Link Dist (ft)		343	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	212	254	218	223	145	4584	2202	1041
Starvation Cap Reductn	0	0	0	0	0	2519	408	595
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.30	0.10	0.34	0.45	0.54	1.36	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	38	261	114	130	11	315	1038	82	65	2217	245
v/c Ratio	1.28	0.16	0.68	0.52	0.61	0.05	1.30	0.37	0.09	0.56	1.25	0.38
Control Delay	225.8	52.3	23.4	66.7	66.9	0.4	204.2	16.7	3.9	75.2	147.7	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6
Total Delay	225.8	52.3	23.4	66.7	66.9	0.4	204.2	16.7	3.9	75.2	148.4	15.6
Queue Length 50th (ft)	~144	29	44	47	106	0	~337	173	1	53	~1222	78
Queue Length 95th (ft)	#293	64	138	83	173	0	#551	243	28	104	#1445	154
Internal Link Dist (ft)		2100			372			343			363	
Turn Bay Length (ft)	130		75	265		150	150		45	220		200
Base Capacity (vph)	106	518	589	252	512	411	243	2814	886	161	1772	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	326	164
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.07	0.44	0.45	0.25	0.03	1.30	0.37	0.09	0.40	1.53	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	53	20	230	1605	3355
v/c Ratio	0.29	0.19	0.89	0.52	0.98
Control Delay	66.5	27.0	91.2	2.6	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	27.0	91.2	2.6	31.1
Queue Length 50th (ft)	24	0	206	130	986
Queue Length 95th (ft)	39	20	#275	128	682
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	478	248	259	3075	3411
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.08	0.89	0.52	0.98

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	116	630	245	201	737	530	1204	164	1274	334
v/c Ratio	0.72	0.67	0.43	1.25	0.74	1.19	1.01	1.03	0.78	0.48
Control Delay	70.6	36.8	8.0	194.1	30.5	144.3	61.1	126.1	35.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	36.8	8.0	194.1	30.5	144.3	61.1	126.1	35.3	8.1
Queue Length 50th (ft)	74	190	12	~165	175	~217	~422	~116	274	22
Queue Length 95th (ft)	#164	250	72	#318	243	#334	#598	#254	345	97
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	168	1087	623	161	1107	447	1196	159	1632	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.58	0.39	1.25	0.67	1.19	1.01	1.03	0.78	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	66	137	440	66	297	502	66	711	99
v/c Ratio	0.28	0.31	1.02	0.13	1.00	0.59	0.53	0.97	0.15
Control Delay	35.2	7.2	88.3	2.4	98.2	21.8	62.5	59.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	7.2	88.3	2.4	98.2	21.8	62.5	59.3	5.0
Queue Length 50th (ft)	37	0	~321	0	212	233	45	483	1
Queue Length 95th (ft)	77	47	#525	12	#390	358	90	#736	34
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	235	448	432	492	297	844	150	733	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.31	1.02	0.13	1.00	0.59	0.44	0.97	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	32	167	512	529	217	61	777	902	278	748
v/c Ratio	0.29	0.56	1.02	1.04	0.38	0.49	0.64	1.09	1.24	0.51
Control Delay	64.4	42.2	91.8	95.2	14.5	72.3	38.3	82.6	186.9	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	42.2	91.8	95.2	14.5	72.3	38.3	82.6	186.9	29.9
Queue Length 50th (ft)	26	43	~487	~510	44	51	288	~625	~293	249
Queue Length 95th (ft)	61	81	#746	#773	117	100	373	#904	#488	330
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	328	762	500	509	572	148	1218	824	224	1455
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.22	1.02	1.04	0.38	0.41	0.64	1.09	1.24	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	159	1218	17	1270	529	23	22	221	221	222
v/c Ratio	0.78	0.71	0.17	1.01	0.73	0.15	0.15	0.64	0.63	0.45
Control Delay	66.5	23.1	46.2	57.0	18.5	42.0	30.2	39.6	39.1	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	23.1	46.2	57.0	18.5	42.0	30.2	39.6	39.1	6.9
Queue Length 50th (ft)	86	237	9	~363	109	12	6	115	115	0
Queue Length 95th (ft)	#202	#471	31	#571	251	37	29	184	183	47
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	203	1723	98	1262	725	155	142	584	591	687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.71	0.17	1.01	0.73	0.15	0.15	0.38	0.37	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1045	522	371	1365	107	438
v/c Ratio	0.82	0.59	0.91	0.60	0.25	0.96
Control Delay	33.5	5.3	62.3	10.6	28.6	61.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	5.3	62.3	10.6	28.6	61.5
Queue Length 50th (ft)	288	0	203	214	48	198
Queue Length 95th (ft)	#374	64	#353	268	91	#379
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1271	878	424	2275	443	466
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.59	0.88	0.60	0.24	0.94

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	211	928	1100	72	555	759	748
v/c Ratio	0.98	0.56	0.99	0.13	0.74	1.08	1.03
Control Delay	106.0	22.8	64.0	8.6	31.8	83.6	68.6
Queue Delay	0.0	0.0	9.9	0.0	0.0	0.0	0.0
Total Delay	106.0	22.8	73.9	8.6	31.8	83.6	68.6
Queue Length 50th (ft)	151	242	405	3	329	~625	~563
Queue Length 95th (ft)	#303	304	#556	37	476	#883	#811
Internal Link Dist (ft)		595	411			642	
Turn Bay Length (ft)	170				455		455
Base Capacity (vph)	215	1653	1106	539	755	706	728
Starvation Cap Reductn	0	0	38	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.56	1.03	0.13	0.74	1.08	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	57	2391	36	856	356	82
v/c Ratio	0.38	0.87	0.31	0.31	0.81	0.20
Control Delay	42.6	21.1	42.6	10.9	42.0	7.2
Queue Delay	0.0	1.0	0.0	0.0	0.0	0.0
Total Delay	42.6	22.2	42.6	10.9	42.0	7.2
Queue Length 50th (ft)	28	397	18	91	163	0
Queue Length 95th (ft)	62	#503	45	114	#270	29
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	149	2746	116	2755	518	470
Starvation Cap Reductn	0	155	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.92	0.31	0.31	0.69	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	130	272	223	560	76	144	114	525
v/c Ratio	0.79	0.58	0.78	0.94	0.56	0.14	0.70	0.49
Control Delay	68.8	30.8	51.7	51.9	52.5	16.6	59.6	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	30.8	51.7	51.9	52.5	16.6	59.6	24.0
Queue Length 50th (ft)	65	115	107	254	37	20	56	110
Queue Length 95th (ft)	#155	192	#207	#452	#90	42	#133	158
Internal Link Dist (ft)		705		2100		773		773
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	165	472	305	608	139	1025	165	1076
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.58	0.73	0.92	0.55	0.14	0.69	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	777	1338	12	686	174	34	47	45
v/c Ratio	0.96	0.40	0.10	0.68	0.63	0.12	0.52	0.23
Control Delay	54.6	11.9	50.8	42.7	53.4	20.7	51.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	11.9	50.8	42.7	53.4	20.7	51.0	2.8
Queue Length 50th (ft)	531	129	8	155	118	7	15	0
Queue Length 95th (ft)	#965	344	28	228	189	35	#76	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	810	3441	119	1136	495	486	91	195
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.39	0.10	0.60	0.35	0.07	0.52	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	14	36	166	59	101	897	168	59	2290
v/c Ratio	0.12	0.15	0.62	0.13	0.64	0.28	0.13	0.36	0.79
Control Delay	36.5	1.2	45.5	0.6	54.9	8.2	1.1	39.2	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	1.2	45.5	0.6	54.9	8.2	1.1	39.2	15.7
Queue Length 50th (ft)	7	0	41	0	48	84	0	27	315
Queue Length 95th (ft)	24	0	#80	0	#121	110	17	63	385
Internal Link Dist (ft)		586		351		599			343
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	121	494	267	607	157	3205	1294	176	2898
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.62	0.10	0.64	0.28	0.13	0.34	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	233	1076	479	444	531	96	6	6
v/c Ratio	0.45	1.12	1.14	0.45	1.03	0.10	0.09	0.02
Control Delay	41.3	83.5	132.3	17.5	91.6	0.2	67.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	83.5	132.3	17.5	91.6	0.2	67.6	0.0
Queue Length 50th (ft)	156	~609	~461	189	448	0	5	0
Queue Length 95th (ft)	258	#924	#745	316	#761	0	21	0
Internal Link Dist (ft)	684			870		7195		1542
Turn Bay Length (ft)		520	360				200	
Base Capacity (vph)	520	961	421	996	518	963	67	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.12	1.14	0.45	1.03	0.10	0.09	0.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	656	302	2056
v/c Ratio	0.59	0.44	0.73	0.79
Control Delay	11.8	14.4	34.8	8.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.8	14.4	34.8	8.4
Queue Length 50th (ft)	3	86	103	158
Queue Length 95th (ft)	56	154	#215	379
Internal Link Dist (ft)	845	10454		3226
Turn Bay Length (ft)	1450		100	
Base Capacity (vph)	615	1478	470	2619
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.44	0.64	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	118	143	198	156	291	12	773	333
v/c Ratio	0.57	0.46	0.73	0.88	0.29	0.13	0.93	0.44
Control Delay	53.5	11.3	57.4	88.7	13.2	52.6	47.1	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	11.3	57.4	88.7	13.2	52.6	47.1	13.1
Queue Length 50th (ft)	74	0	121	102	84	8	469	76
Queue Length 95th (ft)	118	36	184	#205	165	25	#668	136
Internal Link Dist (ft)	422		500		2517		526	
Turn Bay Length (ft)		30		150		140		115
Base Capacity (vph)	310	393	326	178	1012	89	831	755
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.36	0.61	0.88	0.29	0.13	0.93	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	206	434	261	1073
v/c Ratio	0.63	0.51	0.75	0.80
Control Delay	23.3	17.0	42.0	13.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.3	17.0	42.0	13.4
Queue Length 50th (ft)	40	129	105	231
Queue Length 95th (ft)	65	172	148	303
Internal Link Dist (ft)	429	6529		184
Turn Bay Length (ft)	495		85	
Base Capacity (vph)	507	852	394	1346
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.51	0.66	0.80

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	101	270	557	94	124	467	444	364	73	382
v/c Ratio	0.29	0.72	0.77	0.51	0.62	0.79	0.53	0.42	0.50	0.73
Control Delay	37.5	50.3	13.4	54.6	51.6	43.1	26.5	4.1	59.9	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	50.3	13.4	54.6	51.6	43.1	26.5	4.1	59.9	48.9
Queue Length 50th (ft)	55	163	25	58	65	270	213	0	46	118
Queue Length 95th (ft)	112	277	149	119	135	#544	381	58	103	189
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	482	512	800	487	492	594	862	886	195	702
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.53	0.70	0.19	0.25	0.79	0.52	0.41	0.37	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	80	489	21	829	112	590	760
v/c Ratio	0.39	0.68	0.65	0.30	0.97	0.16	0.96	0.51
Control Delay	52.0	86.7	27.0	75.0	61.1	9.9	71.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	86.7	27.0	75.0	61.1	9.9	71.4	7.3
Queue Length 50th (ft)	47	69	256	18	704	20	509	233
Queue Length 95th (ft)	96	128	373	49	#1040	59	#788	360
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	240	158	748	77	852	716	615	1479
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.51	0.65	0.27	0.97	0.16	0.96	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	111	64	90	133	229	1021	53	218	612
v/c Ratio	1.18	0.11	0.47	0.55	0.74	0.78	0.40	0.52	0.73
Control Delay	184.5	1.1	46.2	29.7	49.1	27.6	50.0	33.8	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	184.5	1.1	46.2	29.7	49.1	27.6	50.0	33.8	8.7
Queue Length 50th (ft)	~77	0	48	34	119	253	28	100	0
Queue Length 95th (ft)	#196	6	97	92	207	356	69	186	100
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	94	586	403	437	415	1509	145	509	880
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.11	0.22	0.30	0.55	0.68	0.37	0.43	0.70

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	147	348	283	564	207	76	164	1620	624	38	1042	76
v/c Ratio	0.70	1.00	0.66	1.03	0.47	0.17	0.87	0.97	0.57	0.59	0.77	0.09
Control Delay	71.6	99.2	29.4	97.8	48.2	0.9	95.3	49.8	11.2	96.3	39.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.5	0.9	0.0	0.0	0.0
Total Delay	71.6	99.2	29.4	97.8	48.2	0.9	95.3	90.3	12.1	96.3	39.5	1.5
Queue Length 50th (ft)	120	~301	97	~264	153	0	138	695	208	32	397	0
Queue Length 95th (ft)	190	#500	200	#380	242	1	#266	#874	309	#88	482	14
Internal Link Dist (ft)		429			1915			582			4602	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	262	349	427	550	436	458	194	1670	1095	64	1391	918
Starvation Cap Reductn	0	0	0	0	0	0	0	193	226	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.00	0.66	1.03	0.47	0.17	0.85	1.10	0.72	0.59	0.75	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	568	109	139	2195	391	335	1475
v/c Ratio	1.26	1.07	0.23	1.07	0.42	1.16	0.49
Control Delay	167.2	165.6	5.8	78.8	8.5	152.1	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.2	165.6	5.8	78.8	8.5	152.1	15.4
Queue Length 50th (ft)	~538	~101	0	~749	66	~334	242
Queue Length 95th (ft)	#768	#224	46	#842	140	#525	280
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	452	102	606	2053	934	288	3007
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	1.07	0.23	1.07	0.42	1.16	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	451	27	303	128	32	96	234	2287	59	106	1980	206
v/c Ratio	1.06	0.08	0.41	0.64	0.29	0.52	0.77	1.39	0.08	0.59	0.99	0.31
Control Delay	107.7	48.5	7.1	69.1	65.5	21.9	67.8	206.9	5.8	68.8	57.1	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	3.2	0.0
Total Delay	107.7	48.5	7.1	69.1	65.5	21.9	67.8	208.6	5.8	68.8	60.4	18.3
Queue Length 50th (ft)	~407	19	0	102	26	0	186	~1314	1	85	586	66
Queue Length 95th (ft)	#699	51	46	177	63	57	285	#1604	27	153	#829	146
Internal Link Dist (ft)		707			448			403			594	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	425	430	875	412	430	432	607	2085	935	278	1997	669
Starvation Cap Reductn	0	0	0	0	0	0	0	243	0	0	28	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.06	0.35	0.31	0.07	0.22	0.39	1.24	0.06	0.38	1.01	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	37	128	1101	249	242	324	2094	271	2373	37
v/c Ratio	0.58	0.35	0.96	0.55	0.51	1.06	0.71	0.26	1.28	0.06
Control Delay	99.3	16.1	63.7	44.2	29.0	118.0	25.3	2.5	168.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Total Delay	99.3	16.1	63.7	44.2	29.0	118.0	25.3	2.5	169.4	0.2
Queue Length 50th (ft)	34	26	495	185	115	~345	548	14	~1002	0
Queue Length 95th (ft)	#88	59	#628	283	208	m#523	m599	m42	#1091	0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	64	368	1190	455	482	306	2937	1035	1848	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	303	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.35	0.93	0.55	0.50	1.06	0.71	0.26	1.54	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	657	189	105	132	326	2588	168	284	1637	548
v/c Ratio	0.91	0.52	0.41	0.96	1.45	0.69	0.17	0.96	0.66	0.42
Control Delay	71.0	64.7	14.1	131.1	255.3	21.1	3.9	94.4	7.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	47.1	0.0	0.0	0.0	0.0
Total Delay	71.0	64.7	14.1	131.1	255.3	68.2	3.9	94.4	7.5	0.8
Queue Length 50th (ft)	299	86	0	122	~319	465	13	136	294	0
Queue Length 95th (ft)	#393	128	53	#257	#517	504	45	m#153	m294	m0
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	760	1083	551	137	225	3728	1011	297	2495	1296
Starvation Cap Reductn	0	0	0	0	0	1385	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.17	0.19	0.96	1.45	1.10	0.17	0.96	0.66	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	168	82	32	82	60	2668	1728	207
v/c Ratio	0.70	0.29	0.26	0.40	0.39	0.60	0.84	0.21
Control Delay	60.6	15.0	53.3	11.4	53.9	10.8	27.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.9	47.2	0.0
Total Delay	60.6	15.0	53.3	11.4	53.9	11.6	74.2	8.1
Queue Length 50th (ft)	114	7	22	0	41	280	553	34
Queue Length 95th (ft)	183	50	53	31	82	363	#833	87
Internal Link Dist (ft)		220	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	289	324	297	348	155	4414	2062	966
Starvation Cap Reductn	0	0	0	0	0	1318	506	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.11	0.24	0.39	0.86	1.11	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	60	527	168	109	16	321	2488	201	109	1603	114
v/c Ratio	1.14	0.13	0.93	0.79	0.30	0.04	1.13	1.00	0.24	0.96	1.12	0.16
Control Delay	162.7	42.5	53.5	92.1	50.5	0.1	146.2	55.7	10.8	140.0	103.6	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
Total Delay	162.7	42.5	53.5	92.1	50.5	0.1	146.2	55.7	10.8	140.0	104.8	2.3
Queue Length 50th (ft)	~255	44	293	83	87	0	~365	~938	46	107	~952	0
Queue Length 95th (ft)	#438	83	#498	#150	145	0	#575	#1056	102	#243	#1122	22
Internal Link Dist (ft)		2122			372			324			363	
Turn Bay Length (ft)	130		75	265		150	150		45	220		200
Base Capacity (vph)	195	548	634	212	466	509	284	2479	830	114	1432	725
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	369	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.11	0.83	0.79	0.23	0.03	1.13	1.00	0.24	0.96	1.51	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	300	184	63	2594	2263
v/c Ratio	0.61	0.51	0.42	0.98	0.70
Control Delay	43.9	14.7	50.7	25.1	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	14.7	50.7	25.1	13.6
Queue Length 50th (ft)	88	16	36	623	317
Queue Length 95th (ft)	130	77	80	#1048	425
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	683	439	171	2660	3240
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.42	0.37	0.98	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	361	344	672	113	488	522	2241	354	1742	248
v/c Ratio	1.40	0.41	1.14	1.01	0.79	0.89	1.49	1.45	0.87	0.36
Control Delay	245.3	48.0	112.0	153.1	52.8	77.1	256.0	266.8	46.2	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	245.3	48.0	112.0	153.1	52.8	77.1	256.0	266.8	46.2	14.2
Queue Length 50th (ft)	~454	145	~532	~110	174	251	~1544	~454	552	64
Queue Length 95th (ft)	#657	194	#779	#243	241	#345	#1675	#656	620	136
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	258	846	588	112	615	591	1504	244	2007	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	0.41	1.14	1.01	0.79	0.88	1.49	1.45	0.87	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	341	418	258	60	170	1412	49	584	27
v/c Ratio	1.18	0.54	1.25	0.11	0.77	1.38	0.75	0.71	0.04
Control Delay	155.2	6.6	187.1	4.7	83.5	206.6	126.5	39.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	155.2	6.6	187.1	4.7	83.5	206.6	126.5	39.3	0.1
Queue Length 50th (ft)	~402	6	~316	0	162	~1847	48	453	0
Queue Length 95th (ft)	#605	93	#498	23	242	#2118	#127	632	0
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	289	773	207	525	275	1022	65	826	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.54	1.25	0.11	0.62	1.38	0.75	0.71	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	74	308	516	527	314	53	824	900	202	933
v/c Ratio	0.34	0.71	1.07	1.08	0.52	0.50	0.66	1.09	1.12	0.64
Control Delay	60.0	65.3	108.9	112.1	16.8	80.9	40.9	83.8	157.3	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	65.3	108.9	112.1	16.8	80.9	40.9	83.8	157.3	36.0
Queue Length 50th (ft)	62	136	~544	~561	70	47	327	~670	~209	362
Queue Length 95th (ft)	114	188	#823	#840	173	97	423	#964	#389	465
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	348	692	481	486	605	116	1258	823	181	1459
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.45	1.07	1.08	0.52	0.46	0.66	1.09	1.12	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	343	1214	36	1141	536	57	37	265	266	270
v/c Ratio	0.99	0.68	0.41	1.01	0.81	0.44	0.26	0.70	0.69	0.48
Control Delay	89.8	23.9	62.9	64.0	26.1	58.6	36.4	45.9	45.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.8	23.9	62.9	64.0	26.1	58.6	36.4	45.9	45.7	6.7
Queue Length 50th (ft)	224	331	23	~396	153	36	13	165	166	0
Queue Length 95th (ft)	#452	479	#61	#614	#380	83	48	254	255	61
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	345	1779	88	1134	663	129	141	533	537	688
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.68	0.41	1.01	0.81	0.44	0.26	0.50	0.50	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1184	563	674	1426	74	352
v/c Ratio	0.97	0.71	1.00	0.54	0.24	1.02
Control Delay	64.5	16.5	77.4	7.5	52.6	94.7
Queue Delay	0.0	0.0	25.4	0.8	0.0	0.0
Total Delay	64.5	16.5	102.8	8.4	52.6	94.7
Queue Length 50th (ft)	557	129	610	240	59	~264
Queue Length 95th (ft)	#708	277	#878	283	108	#468
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1222	793	675	2650	308	346
Starvation Cap Reductn	0	0	49	830	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.71	1.08	0.78	0.24	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	337	962	1685	147	382	367	360
v/c Ratio	1.03	0.39	1.02	0.18	1.02	0.86	0.76
Control Delay	99.3	7.4	53.8	4.8	92.4	46.6	31.0
Queue Delay	0.0	0.0	32.5	0.0	0.0	0.0	0.0
Total Delay	99.3	7.4	86.3	4.8	92.4	46.6	31.0
Queue Length 50th (ft)	~231	123	~572	8	~273	175	123
Queue Length 95th (ft)	#403	156	#738	42	#465	#356	#266
Internal Link Dist (ft)		595	411			642	
Turn Bay Length (ft)	170				455		455
Base Capacity (vph)	327	2444	1658	807	373	426	472
Starvation Cap Reductn	0	0	253	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.39	1.20	0.18	1.02	0.86	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	60	1539	63	1582	275	63
v/c Ratio	0.28	0.69	0.31	0.71	0.61	0.13
Control Delay	26.2	14.8	27.5	16.9	22.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	14.8	27.5	16.9	22.8	1.9
Queue Length 50th (ft)	17	134	18	156	75	0
Queue Length 95th (ft)	51	#255	53	#288	135	9
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	217	2242	203	2242	732	711
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.69	0.31	0.71	0.38	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	489	179	326	54	902	190	418
v/c Ratio	0.56	0.97	0.87	0.53	0.38	0.91	0.89	0.33
Control Delay	52.5	62.2	74.6	23.7	42.8	39.5	75.7	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	62.2	74.6	23.7	42.8	39.5	75.7	17.9
Queue Length 50th (ft)	37	231	89	121	26	196	95	72
Queue Length 95th (ft)	#90	#424	#202	203	61	#314	#212	112
Internal Link Dist (ft)		705		2122		773		773
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	139	506	205	620	148	986	214	1255
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.97	0.87	0.53	0.36	0.91	0.89	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	185	1029	32	1154	130	47	257	243
v/c Ratio	0.92	0.43	0.21	0.65	0.38	0.14	1.24	0.63
Control Delay	82.7	14.7	36.4	21.2	26.5	9.0	168.4	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	14.7	36.4	21.2	26.5	9.0	168.4	13.9
Queue Length 50th (ft)	75	75	12	132	48	2	~116	0
Queue Length 95th (ft)	#253	213	45	260	89	23	#331	#93
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	201	2414	150	1975	862	808	207	386
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.43	0.21	0.58	0.15	0.06	1.24	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	90	437	175	52	2421	421	154	1955
v/c Ratio	0.59	0.41	0.86	0.58	0.40	0.89	0.34	0.86	0.66
Control Delay	58.4	8.9	62.6	14.4	57.9	27.6	2.5	87.3	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.1
Total Delay	58.4	8.9	62.6	14.4	57.9	30.1	2.5	87.3	17.9
Queue Length 50th (ft)	76	0	154	0	35	516	22	106	335
Queue Length 95th (ft)	138	23	#261	58	78	#678	63	#240	449
Internal Link Dist (ft)		536		371		594			341
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	251	371	510	423	150	2734	1234	180	2969
Starvation Cap Reductn	0	0	0	0	0	205	0	0	176
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.24	0.86	0.41	0.35	0.96	0.34	0.86	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	5	500	665	202	380	1284	369
v/c Ratio	0.08	1.18	0.93	1.25	0.60	1.31	0.36
Control Delay	68.2	149.7	36.5	202.1	43.0	176.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	149.7	36.5	202.1	43.0	176.6	2.5
Queue Length 50th (ft)	5	~547	227	~229	278	~1507	3
Queue Length 95th (ft)	20	#769	#487	#393	431	#1773	48
Internal Link Dist (ft)		684			870		8961
Turn Bay Length (ft)	250		520	360			
Base Capacity (vph)	64	423	718	162	632	978	1039
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.18	0.93	1.25	0.60	1.31	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	324	2170	258	1113
v/c Ratio	0.87	0.98	0.87	0.39
Control Delay	39.7	40.1	80.2	3.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.7	40.1	80.2	3.7
Queue Length 50th (ft)	79	~1021	210	104
Queue Length 95th (ft)	#191	#1157	#388	156
Internal Link Dist (ft)	845	10454		1460
Turn Bay Length (ft)	1450		100	
Base Capacity (vph)	430	2208	297	2845
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.98	0.87	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	393	210	106	131	532	17	212	146
v/c Ratio	0.82	0.38	0.45	0.54	0.67	0.14	0.40	0.25
Control Delay	43.9	8.4	36.0	41.3	25.4	40.1	29.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	8.4	36.0	41.3	25.4	40.1	29.0	3.7
Queue Length 50th (ft)	183	10	44	61	196	8	90	0
Queue Length 95th (ft)	#361	64	91	120	#448	29	167	28
Internal Link Dist (ft)	422		500		2517		526	
Turn Bay Length (ft)		30		150		140		115
Base Capacity (vph)	515	580	446	310	792	123	535	587
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.36	0.24	0.42	0.67	0.14	0.40	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	487	295	115
v/c Ratio	0.53	0.68	0.72	0.09
Control Delay	10.6	21.6	32.1	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.6	21.6	32.1	3.2
Queue Length 50th (ft)	4	122	83	8
Queue Length 95th (ft)	47	#270	#193	25
Internal Link Dist (ft)	429	6529		184
Turn Bay Length (ft)	495		85	
Base Capacity (vph)	657	711	428	1320
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.68	0.69	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	93	105	360	152	74	335	437	319	37	302
v/c Ratio	0.38	0.43	0.68	0.54	0.26	0.79	0.56	0.39	0.33	0.48
Control Delay	32.7	33.9	10.9	35.4	23.0	44.0	20.6	3.9	44.0	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	33.9	10.9	35.4	23.0	44.0	20.6	3.9	44.0	27.0
Queue Length 50th (ft)	33	38	0	54	18	121	140	0	14	54
Queue Length 95th (ft)	78	86	45	117	54	#309	249	33	46	94
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	720	719	865	771	747	422	932	905	111	1097
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.15	0.42	0.20	0.10	0.79	0.47	0.35	0.33	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	114	313	23	677	136	460	588
v/c Ratio	0.16	0.53	0.43	0.18	0.86	0.20	0.84	0.42
Control Delay	25.6	42.2	10.6	42.2	37.0	6.6	42.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	42.2	10.6	42.2	37.0	6.6	42.6	7.6
Queue Length 50th (ft)	13	56	64	12	323	8	222	83
Queue Length 95th (ft)	39	105	113	36	#569	44	#407	250
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)				100		125	190	
Base Capacity (vph)	426	358	798	136	864	748	630	1388
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.32	0.39	0.17	0.78	0.18	0.73	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	112	51	56	135	309	792	34	185	596
v/c Ratio	1.30	0.09	0.28	0.60	0.84	0.57	0.29	0.48	0.74
Control Delay	233.6	0.3	40.6	41.2	55.8	22.8	48.3	34.8	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	233.6	0.3	40.6	41.2	55.8	22.8	48.3	34.8	9.0
Queue Length 50th (ft)	~87	0	30	58	171	180	19	90	0
Queue Length 95th (ft)	#201	0	66	115	#325	260	51	161	89
Internal Link Dist (ft)	310			268		126		222	
Turn Bay Length (ft)		250	275		85		160		95
Base Capacity (vph)	86	543	379	401	409	1501	133	479	858
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.09	0.15	0.34	0.76	0.53	0.26	0.39	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	234	283	567	181	37	190	801	581	43	818	43
v/c Ratio	0.48	0.57	0.61	1.02	0.32	0.06	1.16	0.62	0.53	0.40	0.81	0.06
Control Delay	46.1	34.8	19.6	80.6	25.8	0.2	158.5	26.3	6.7	51.6	36.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	34.8	19.6	80.6	25.8	0.2	158.5	26.3	6.7	51.6	36.5	0.8
Queue Length 50th (ft)	43	111	60	~170	78	0	~123	196	59	23	213	0
Queue Length 95th (ft)	92	182	139	#291	134	0	#267	284	165	58	#330	5
Internal Link Dist (ft)		429			1915			582			6350	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	208	537	555	557	622	625	164	1284	1088	107	1027	781
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.44	0.51	1.02	0.29	0.06	1.16	0.62	0.53	0.40	0.80	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	281	120	90	1427	292	260	1374
v/c Ratio	0.89	0.66	0.22	0.78	0.29	0.91	0.46
Control Delay	43.7	48.5	4.9	21.9	1.9	64.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.7	48.5	4.9	21.9	1.9	64.7	7.8
Queue Length 50th (ft)	38	47	0	180	0	102	94
Queue Length 95th (ft)	#164	#118	23	231	29	#223	123
Internal Link Dist (ft)				224			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	316	181	464	1834	1011	298	3016
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.66	0.19	0.78	0.29	0.87	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	21	219	146	31	68	219	1577	89	104	1571	216
v/c Ratio	0.73	0.07	0.35	0.66	0.28	0.37	0.75	0.95	0.12	0.58	0.76	0.31
Control Delay	56.6	48.8	8.0	67.3	64.9	11.9	65.7	45.0	9.3	67.4	36.1	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.1	0.0
Total Delay	56.6	48.8	8.0	67.3	64.9	11.9	65.7	46.7	9.3	67.4	36.2	14.8
Queue Length 50th (ft)	235	14	0	115	25	0	172	640	14	82	403	56
Queue Length 95th (ft)	#410	43	41	192	61	30	266	#903	49	148	530	131
Internal Link Dist (ft)		707			465			403			593	
Turn Bay Length (ft)	185			60		150	265			305		220
Base Capacity (vph)	422	444	843	425	427	460	633	2151	972	283	2060	704
Starvation Cap Reductn	0	0	0	0	0	0	0	383	0	0	32	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.05	0.26	0.34	0.07	0.15	0.35	0.89	0.09	0.37	0.77	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	1135	297	273	417	1518	250	1883	26
v/c Ratio	1.12	0.61	0.93	0.64	0.58	0.98	0.53	0.25	1.32	0.05
Control Delay	196.3	28.9	54.7	44.2	29.3	84.6	21.5	2.8	187.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	196.3	28.9	54.7	44.2	29.3	84.6	21.5	2.8	187.3	0.2
Queue Length 50th (ft)	~80	114	465	209	126	~375	340	10	~750	0
Queue Length 95th (ft)	#190	223	547	308	220	m#596	m393	m27	#846	0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	74	494	1304	503	503	426	2851	988	1425	534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	57	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	0.61	0.87	0.59	0.54	0.98	0.53	0.25	1.38	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	700	294	88	129	356	1453	103	448	1084	456
v/c Ratio	0.84	0.71	0.31	0.80	1.04	0.49	0.12	0.81	0.46	0.38
Control Delay	56.9	65.1	6.6	90.7	95.7	24.5	1.4	55.0	6.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	56.9	65.1	6.6	90.7	95.7	25.2	1.4	55.0	6.0	0.8
Queue Length 50th (ft)	290	128	0	107	217	254	0	192	123	0
Queue Length 95th (ft)	345	172	26	#194	#443	292	14	m198	m194	m14
Internal Link Dist (ft)		760				324			539	
Turn Bay Length (ft)	350		205	345	330		280	250		500
Base Capacity (vph)	866	1143	580	186	355	2939	851	577	2366	1196
Starvation Cap Reductn	0	0	0	0	0	1033	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.26	0.15	0.69	1.00	0.76	0.12	0.78	0.46	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	177	73	25	104	48	1369	1288	209
v/c Ratio	0.65	0.24	0.21	0.44	0.31	0.34	0.66	0.23
Control Delay	46.5	13.3	42.3	11.1	42.9	8.6	20.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Total Delay	46.5	13.3	42.3	11.1	42.9	8.6	21.9	7.6
Queue Length 50th (ft)	95	6	14	0	26	99	303	25
Queue Length 95th (ft)	155	42	38	34	59	145	#516	78
Internal Link Dist (ft)		235	420			363	324	
Turn Bay Length (ft)					90			100
Base Capacity (vph)	354	374	307	403	156	4065	1940	925
Starvation Cap Reductn	0	0	0	0	0	0	382	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.20	0.08	0.26	0.31	0.34	0.83	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	253	108	515	77	211	5	531	1144	180	119	929	263
v/c Ratio	0.96	0.23	0.66	0.44	0.73	0.01	0.98	0.50	0.23	0.67	1.03	0.51
Control Delay	103.0	41.8	7.6	71.7	69.9	0.0	81.7	28.9	11.0	77.1	87.0	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.9	0.2
Total Delay	103.0	41.8	7.6	71.7	69.9	0.0	81.7	28.9	11.0	77.1	113.9	22.5
Queue Length 50th (ft)	224	77	0	34	180	0	464	260	34	102	~459	81
Queue Length 95th (ft)	#427	129	94	64	267	0	#759	354	95	173	#645	182
Internal Link Dist (ft)		2096			372			407			363	
Turn Bay Length (ft)	130		75	265		150	150		45	220		200
Base Capacity (vph)	264	666	901	181	490	528	541	2272	777	237	902	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	113	25
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.16	0.57	0.43	0.43	0.01	0.98	0.50	0.23	0.50	1.18	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	98	54	38	1771	1664
v/c Ratio	0.22	0.21	0.21	0.68	0.51
Control Delay	20.7	8.6	24.1	7.2	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	8.6	24.1	7.2	8.0
Queue Length 50th (ft)	14	0	11	144	69
Queue Length 95th (ft)	28	23	32	240	186
Internal Link Dist (ft)	243			1641	735
Turn Bay Length (ft)	200	60	200		
Base Capacity (vph)	1223	615	179	2604	3295
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.09	0.21	0.68	0.51

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	195	297	333	83	373	276	1422	247	1149	142
v/c Ratio	0.73	0.40	0.61	0.84	0.68	0.62	0.98	0.99	0.54	0.20
Control Delay	60.3	37.2	12.6	106.7	28.0	51.5	51.9	103.5	25.3	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	37.2	12.6	106.7	28.0	51.5	51.9	103.5	25.3	4.5
Queue Length 50th (ft)	129	92	33	58	61	93	502	~173	217	0
Queue Length 95th (ft)	216	132	118	#160	114	146	#749	#366	293	41
Internal Link Dist (ft)		2463			277		1382		1641	
Turn Bay Length (ft)	240			315		245		245		175
Base Capacity (vph)	332	1029	649	99	676	474	1449	249	2144	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.29	0.51	0.84	0.55	0.58	0.98	0.99	0.54	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	192	159	82	27	154	781	27	603	99
v/c Ratio	0.63	0.34	0.25	0.06	0.63	0.76	0.21	0.77	0.14
Control Delay	33.6	6.2	23.8	0.2	42.5	21.0	36.4	26.3	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	6.2	23.8	0.2	42.5	21.0	36.4	26.3	2.2
Queue Length 50th (ft)	74	0	29	0	62	179	11	204	0
Queue Length 95th (ft)	136	40	63	0	#155	#598	37	#435	17
Internal Link Dist (ft)	400		788			1712		4110	
Turn Bay Length (ft)		315		140	210		200		150
Base Capacity (vph)	540	700	568	713	260	1023	126	847	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.23	0.14	0.04	0.59	0.76	0.21	0.71	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	81	202	291	295	154	16	634	566	165	622
v/c Ratio	0.38	0.46	0.68	0.69	0.30	0.18	0.61	0.75	0.95	0.43
Control Delay	41.6	32.7	37.2	37.6	6.2	47.0	28.2	15.8	98.3	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	32.7	37.2	37.6	6.2	47.0	28.2	15.8	98.3	20.1
Queue Length 50th (ft)	41	44	148	150	0	8	145	67	~91	107
Queue Length 95th (ft)	90	83	247	249	44	31	232	228	#244	211
Internal Link Dist (ft)		848		1359			1411			2879
Turn Bay Length (ft)	130		250			265		110	230	
Base Capacity (vph)	635	1244	598	599	655	90	1212	806	174	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.16	0.49	0.49	0.24	0.18	0.52	0.70	0.95	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	354	804	27	537	548	53	48	222	225	236
v/c Ratio	1.10	0.49	0.22	0.56	0.68	0.34	0.28	0.60	0.60	0.45
Control Delay	113.6	18.5	44.2	28.6	7.4	45.0	27.1	35.9	36.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.6	18.5	44.2	28.6	7.4	45.0	27.1	35.9	36.0	6.7
Queue Length 50th (ft)	~209	127	13	122	0	26	10	107	108	0
Queue Length 95th (ft)	#448	263	43	195	86	69	47	189	191	55
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150	100		325		
Base Capacity (vph)	323	1659	126	1205	873	157	172	678	682	765
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.48	0.21	0.45	0.63	0.34	0.28	0.33	0.33	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	763	495	468	942	47	205
v/c Ratio	0.51	0.53	0.84	0.33	0.28	0.70
Control Delay	23.1	4.8	41.7	3.1	40.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	4.8	41.7	3.1	40.3	23.9
Queue Length 50th (ft)	161	0	243	50	26	26
Queue Length 95th (ft)	280	77	323	109	54	89
Internal Link Dist (ft)	615			595		716
Turn Bay Length (ft)		280	300		635	
Base Capacity (vph)	1485	941	598	2837	443	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.53	0.78	0.33	0.11	0.39

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	228	628	950	111	346	334	315
v/c Ratio	0.78	0.30	0.77	0.17	0.80	0.76	0.55
Control Delay	42.8	6.5	21.8	4.2	35.4	28.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	6.5	21.8	4.2	35.4	28.0	8.9
Queue Length 50th (ft)	72	48	145	0	108	85	16
Queue Length 95th (ft)	#164	73	#237	26	#230	#207	75
Internal Link Dist (ft)		595	411			642	
Turn Bay Length (ft)	170				455		455
Base Capacity (vph)	308	2079	1240	643	451	458	581
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.30	0.77	0.17	0.77	0.73	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	65	995	48	772	266	64
v/c Ratio	0.27	0.44	0.21	0.38	0.55	0.12
Control Delay	24.3	9.8	24.2	12.2	19.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	9.8	24.2	12.2	19.8	2.0
Queue Length 50th (ft)	17	42	12	60	62	0
Queue Length 95th (ft)	52	119	42	103	128	10
Internal Link Dist (ft)		411		1258		
Turn Bay Length (ft)	75		85		320	320
Base Capacity (vph)	245	2449	228	2294	877	841
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.41	0.21	0.34	0.30	0.08

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	375	228	277	43	965	158	475
v/c Ratio	0.71	0.95	0.90	0.63	0.36	0.99	0.45	0.33
Control Delay	57.4	70.6	76.0	36.4	48.2	53.3	36.3	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	70.6	76.0	36.4	48.2	53.3	36.3	16.5
Queue Length 50th (ft)	84	203	129	133	24	230	80	85
Queue Length 95th (ft)	#166	#378	#263	218	57	#368	140	126
Internal Link Dist (ft)		705		2096		773		773
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	226	393	253	437	126	977	354	1454
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.95	0.90	0.63	0.34	0.99	0.45	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	32	809	34	594	100	40	61	59
v/c Ratio	0.16	0.34	0.17	0.25	0.26	0.11	0.28	0.16
Control Delay	32.0	14.4	32.1	14.1	20.6	9.2	22.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	14.4	32.1	14.1	20.6	9.2	22.2	0.9
Queue Length 50th (ft)	8	52	9	38	23	1	7	0
Queue Length 95th (ft)	45	164	46	121	71	22	56	0
Internal Link Dist (ft)		1258		2463		273	190	
Turn Bay Length (ft)	410		265		140			95
Base Capacity (vph)	197	2868	197	2891	1180	1030	241	398
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.28	0.17	0.21	0.08	0.04	0.25	0.15

Intersection Summary

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	98	542	249	57	1445	574	240	1493
v/c Ratio	0.48	0.33	0.82	0.52	0.47	0.80	0.48	0.82	0.61
Control Delay	39.1	3.1	42.3	7.0	49.3	27.0	2.3	56.5	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	3.1	42.3	7.0	49.3	27.0	2.3	56.5	17.3
Queue Length 50th (ft)	49	0	130	0	27	228	0	114	200
Queue Length 95th (ft)	97	2	#221	45	#73	302	40	#246	266
Internal Link Dist (ft)		477		344		593			344
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	280	514	661	638	121	1804	1186	291	2430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.82	0.39	0.47	0.80	0.48	0.82	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	6	420	785	430	185	1265	460	6	25
v/c Ratio	0.12	1.25	1.01	1.51	0.28	1.40	0.45	0.10	0.33
Control Delay	75.2	181.1	47.6	287.5	35.5	217.2	3.5	73.8	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	181.1	47.6	287.5	35.5	217.2	3.5	73.8	45.0
Queue Length 50th (ft)	6	~519	~269	~591	126	~1674	6	6	6
Queue Length 95th (ft)	21	#628	#362	#701	187	#1658	32	21	34
Internal Link Dist (ft)		684			870		8220		1542
Turn Bay Length (ft)	250		520	360				200	
Base Capacity (vph)	52	337	779	285	656	903	1012	62	76
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	1.25	1.01	1.51	0.28	1.40	0.45	0.10	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	316	1244	188	1027
v/c Ratio	0.67	0.78	0.68	0.42
Control Delay	12.4	18.9	39.3	4.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.4	18.9	39.3	4.7
Queue Length 50th (ft)	11	175	63	52
Queue Length 95th (ft)	72	#328	#167	129
Internal Link Dist (ft)	845	10454		2201
Turn Bay Length (ft)	1450		100	
Base Capacity (vph)	711	1680	291	2562
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.74	0.65	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	615	334	139	187	562	25	316	172
v/c Ratio	0.96	0.50	0.65	0.83	0.87	0.32	0.72	0.36
Control Delay	63.8	20.0	61.0	78.3	51.3	65.6	51.6	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	20.0	61.0	78.3	51.3	65.6	51.6	12.7
Queue Length 50th (ft)	447	112	97	137	405	18	219	21
Queue Length 95th (ft)	361	97	105	145	335	33	207	25
Internal Link Dist (ft)	422		500		2517		526	
Turn Bay Length (ft)		30		150		140		115
Base Capacity (vph)	642	664	283	237	647	79	439	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.50	0.49	0.79	0.87	0.32	0.72	0.36

Intersection Summary

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	124	337	266	171
v/c Ratio	0.38	0.45	0.70	0.13
Control Delay	9.5	14.0	31.1	3.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.5	14.0	31.1	3.3
Queue Length 50th (ft)	3	67	68	12
Queue Length 95th (ft)	37	140	#171	32
Internal Link Dist (ft)	429	6529		184
Turn Bay Length (ft)	495		85	
Base Capacity (vph)	691	745	385	1366
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.45	0.69	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option B

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative Long-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-

Cumulative-Long TermP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	108	1	#84	210	-	-	-	-	**#317**	-	53
8	Sierra College Boulevard & Granite Drive	**#472**	222	-	118	**#642**	69	109	28	34	**#278**	58	-
21	Sierra College Boulevard & Driveway South of Brace Road	20	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	#121	113	18	63	**380**	-	24	-	-	#77	-	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	**763**	141	**#675**	270	-	-	-	**#986**	**#329**	-	55
8	Sierra College Boulevard & Granite Drive	**#363**	**#791**	-	#203	**#638**	92	**#599**	50	44	**192**	61	22
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	8	-	-	-
24	Sierra College Boulevard & Project Driveway	81	**#779**	104	189	**411**	-	#160	24	-	**#251**	39	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	287	34	**#326**	158	-	-	-	#236	**#233**	-	37
8	Sierra College Boulevard & Granite Drive	**#247**	**368**	-	#140	366	79	**#315**	38	35	**188**	50	2
21	Sierra College Boulevard & Driveway South of Brace Road	5	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	69	#371	83	**202**	256	-	105	10	-	**#205**	-	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	2.44%	7.41%	0.00%	1.12%	0.00%	-	-	0.00%	0.67%	-	0.00%
8	0.00%	10.68%	10.00%	0.00%	5.42%	1.36%	2.78%	9.09%	0.00%	5.88%	3.23%	0.00%
21	0.00%	2.59%	-	-	1.06%	0.00%	-	-	-	-	-	-
24	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	-	-	-	-	-	1.87%	-	-	0.39%	-

Notes:

Shading indicates Project impact.

Cumulative Long TermP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	3.08%	0.79%	2.17%	4.30%	0.00%	-	-	0.00%	5.41%	0.00%	0.00%
8	0.00%	12.07%	34.52%	0.00%	14.80%	3.65%	1.66%	7.41%	0.00%	20.00%	6.25%	0.00%
21	0.00%	2.73%	-	-	3.22%	0.00%	-	-	0.00%	-	-	-
24	0.00%	0.00%	100.00%	100.00%	0.00%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.43%	100.00%	-	2.54%	-

Notes:

Shading indicates Project impact.

Cumulative Long TermP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	8.94%	2.10%	6.00%	9.43%	0.00%	-	-	0.00%	9.45%	-	0.00%
8	0.00%	23.02%	40.97%	0.00%	22.18%	6.40%	4.76%	16.67%	0.00%	28.57%	11.76%	0.00%
21	0.00%	7.76%	-	-	7.85%	-	-	-	-	-	-	-
24	0.00%	-8.73%	100.00%	100.00%	-8.12%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	1.15%	100.00%	-	5.80%	-

Notes:

Shading indicates Project impact.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	316	234	916	29	85	2060
v/c Ratio	0.23	1.82	0.50	0.38	0.03	0.58	0.65
Control Delay	1.8	412.3	8.3	10.6	0.2	44.1	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.8	412.3	8.3	10.6	0.2	44.1	8.5
Queue Length 50th (ft)	0	~184	6	78	0	30	162
Queue Length 95th (ft)	0	#317	53	108	1	#84	210
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	545	174	802	2431	1150	157	3166
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	1.82	0.29	0.38	0.03	0.54	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	75	11	130	177	32	26	365	1148	83	2038	153
v/c Ratio	0.53	0.11	0.50	0.87	0.24	0.12	0.90	0.41	0.55	0.92	0.21
Control Delay	66.6	56.8	16.2	90.1	56.9	1.2	71.6	14.2	66.8	39.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.0
Total Delay	66.6	56.8	16.2	90.1	56.9	1.2	71.6	14.6	66.8	39.7	8.9
Queue Length 50th (ft)	57	8	0	138	24	0	278	164	63	534	24
Queue Length 95th (ft)	109	28	34	#278	58	0	#472	222	118	#642	69
Internal Link Dist (ft)		707			411			403		628	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	183	429	701	203	446	467	405	2834	193	2226	745
Starvation Cap Reductn	0	0	0	0	0	0	0	1014	0	7	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.03	0.19	0.87	0.07	0.06	0.90	0.63	0.43	0.92	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	14	36	154	63	101	897	157	61	2290
v/c Ratio	0.12	0.14	0.61	0.14	0.65	0.28	0.12	0.34	0.78
Control Delay	36.5	1.2	46.0	0.7	55.0	8.5	1.2	37.2	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	1.2	46.0	0.7	55.0	8.5	1.2	37.2	15.3
Queue Length 50th (ft)	7	0	38	0	48	85	0	28	310
Queue Length 95th (ft)	24	0	#77	0	#121	113	18	63	380
Internal Link Dist (ft)		586		351		628			307
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	120	496	252	599	156	3182	1280	210	2922
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.61	0.11	0.65	0.28	0.12	0.29	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	568	116	135	2198	394	335	1475
v/c Ratio	1.45	2.11	0.26	0.84	0.38	1.43	0.43
Control Delay	254.6	587.3	7.9	36.4	7.5	260.9	12.3
Queue Delay	0.0	0.0	0.0	28.9	0.0	0.0	0.4
Total Delay	254.6	587.3	7.9	65.3	7.5	260.9	12.7
Queue Length 50th (ft)	~744	~191	0	699	74	~470	240
Queue Length 95th (ft)	#986	#329	55	763	141	#675	270
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	391	55	512	2630	1040	235	3397
Starvation Cap Reductn	0	0	0	551	0	0	1267
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.45	2.11	0.26	1.06	0.38	1.43	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	449	29	303	160	34	96	234	2345	106	1948	204
v/c Ratio	1.02	0.09	0.42	0.69	0.30	0.43	0.98	0.95	0.92	0.92	0.28
Control Delay	93.9	45.6	7.0	66.1	61.4	9.2	107.6	39.8	122.4	42.6	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.4	0.0	0.0	0.0
Total Delay	93.9	45.6	7.0	66.1	61.4	9.2	107.6	84.2	122.4	42.6	10.2
Queue Length 50th (ft)	~368	20	0	123	26	0	188	630	85	527	36
Queue Length 95th (ft)	#599	50	44	192	61	22	#363	#791	#203	#638	92
Internal Link Dist (ft)		707			466			403		618	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	441	564	1053	315	446	474	238	2472	115	2112	730
Starvation Cap Reductn	0	0	0	0	0	0	0	542	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.05	0.29	0.51	0.08	0.20	0.98	1.22	0.92	0.92	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	90	402	182	52	2421	387	161	1955
v/c Ratio	0.67	0.45	0.87	0.53	0.42	0.90	0.33	0.69	0.64
Control Delay	70.5	10.6	69.8	9.0	62.7	31.2	3.7	63.6	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.3
Total Delay	70.5	10.6	69.8	9.0	62.7	36.5	3.7	63.6	16.6
Queue Length 50th (ft)	84	0	155	0	38	574	35	117	337
Queue Length 95th (ft)	#160	23	#250	39	81	#779	86	189	411
Internal Link Dist (ft)		536		371		618			317
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	185	354	461	473	144	2677	1176	299	3073
Starvation Cap Reductn	0	0	0	0	0	220	0	0	456
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.25	0.87	0.38	0.36	0.99	0.33	0.54	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	281	132	83	1433	298	260	1374
v/c Ratio	0.85	1.36	0.22	0.64	0.29	0.92	0.42
Control Delay	47.2	251.5	8.6	21.3	2.0	77.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	251.5	8.6	21.3	2.0	77.3	8.0
Queue Length 50th (ft)	100	~115	0	239	0	167	131
Queue Length 95th (ft)	#236	#233	37	287	34	#326	158
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	361	97	446	2536	1028	284	3575
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.36	0.19	0.57	0.29	0.92	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	306	25	219	204	35	68	219	1666	104	1513	211
v/c Ratio	0.78	0.12	0.43	0.70	0.25	0.27	0.77	0.75	0.65	0.81	0.31
Control Delay	50.0	38.0	8.3	49.1	44.1	2.6	56.8	24.4	61.7	30.9	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	50.0	38.0	8.3	49.1	44.1	2.6	56.8	24.9	61.7	30.9	7.4
Queue Length 50th (ft)	170	13	0	112	20	0	124	293	60	291	18
Queue Length 95th (ft)	#315	38	35	188	50	2	#247	368	#140	366	68
Internal Link Dist (ft)		707			437			403		597	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	390	659	1146	341	584	625	284	2208	159	1859	680
Starvation Cap Reductn	0	0	0	0	0	0	0	177	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.04	0.19	0.60	0.06	0.11	0.77	0.82	0.65	0.81	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	98	477	262	57	1445	505	253	1493
v/c Ratio	0.50	0.38	0.78	0.47	0.44	0.78	0.44	0.72	0.56
Control Delay	44.0	5.3	44.4	2.9	50.6	28.6	2.7	43.8	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	5.3	44.4	2.9	50.6	28.6	2.7	43.8	15.7
Queue Length 50th (ft)	56	0	131	0	31	256	5	132	207
Queue Length 95th (ft)	105	10	#205	0	69	#371	52	202	256
Internal Link Dist (ft)		477		344		597			338
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	272	476	634	701	132	1863	1148	465	2649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.21	0.75	0.37	0.43	0.78	0.44	0.54	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option C

Existing plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative Short-Term plus Project Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	-	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
26	Sierra College Boulevard/Sierra College Blvd & SR 193	-	900	40	-	150	-	-	1,900	600	465	2,500	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative Long-Term Conditions - Storage Length

Intersection	Street Name	Storage Length (feet)											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	620	620	170	520	-	-	-	860	100	-	1,000
8	Sierra College Boulevard & Granite Drive	265	370	365	305	1,250	220	185	2,550	2,550	160	600	160
21	Sierra College Boulevard & Driveway South of Brace Road	95	415	-	-	220	-	-	-	60	-	-	-
24	Sierra College Boulevard & Project Driveway	160	550	160	190	390	-	-	-	-	150	-	150
25	Brace Road & Project Driveway	-	-	120	-	-	-	-	190	-	-	430	-
37	Project Driveway East & Brace Road	-	150	-	-	-	-	-	430	-	200	215	-

Cumulative-Long TermP AM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	138	-	#74	288	-	-	-	-	**#212**	-	38
8	Sierra College Boulevard & Granite Drive	**#472**	223	-	118	**#642**	69	109	28	34	**#278**	58	-
21	Sierra College Boulevard & Driveway South of Brace Road	20	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	#121	109	17	63	**383**	-	24	-	-	#74	-	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Taylor Road & Webb Street	-	0	-	-	-	-	-	-	-	0	-	-

Notes:
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m - Volume for 95th percentile queue is metered by upstream signal.
Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP PM

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	**#842**	140	**#525**	280	-	-	-	**#768**	**#224**	-	46
8	Sierra College Boulevard & Granite Drive	**#363**	**#791**	-	#203	**#638**	92	**#599**	50	44	**192**	61	22
21	Sierra College Boulevard & Driveway South of Brace Road	3	-	-	-	-	-	-	-	8	-	-	-
24	Sierra College Boulevard & Project Driveway	77	**645**	70	**#236**	**431**	-	#157	19	-	**#239**	77	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Taylor Road & Webb Street	-	3	-	-	-	-	-	-	-	0	-	-

Notes:
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m - Volume for 95th percentile queue is metered by upstream signal.
Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP SAT

Intersection	Street Name	95th Percentile Queues											
#	North-South	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	Sierra College Boulevard & Brace Road	-	231	29	**#223**	123	-	-	-	#164	**#118**	-	23
8	Sierra College Boulevard & Granite Drive	**#247**	**368**	-	#140	366	79	**#315**	38	35	**188**	50	2
21	Sierra College Boulevard & Driveway South of Brace Road	5	-	-	-	-	-	-	-	-	-	-	-
24	Sierra College Boulevard & Project Driveway	#74	302	47	**#241**	263	-	98	2	-	**#196**	41	-
25	Brace Road & Project Driveway	-	-	-	-	-	-	-	-	-	-	-	-
37	Taylor Road & Webb Street	-	5	-	-	-	-	-	-	-	3	-	-

Notes:
- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m - Volume for 95th percentile queue is metered by upstream signal.
Bold indicated queues in excess of capacity. Shading indicates Project impact.

Cumulative-Long TermP AM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	2.21%	0.00%	0.00%	1.12%	0.00%	-	-	0.00%	0.00%	-	0.90%
8	0.00%	10.68%	10.00%	0.00%	5.42%	1.36%	2.78%	9.09%	0.00%	5.88%	3.23%	0.00%
21	0.00%	2.15%	-	-	0.97%	0.00%	-	-	-	-	-	-
24	0.00%	-4.24%	100.00%	100.00%	-1.59%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	-	-	-	-	-	0.00%	-	-	0.39%	-
37	100.00%	-	100.00%	-	-	-	-	0.00%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Long TermP PM

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	2.94%	0.00%	2.17%	4.30%	0.00%	-	-	0.00%	0.00%	0.00%	2.26%
8	0.00%	12.07%	34.52%	0.00%	14.80%	3.65%	1.66%	7.41%	0.00%	20.00%	6.25%	0.00%
21	0.00%	2.50%	-	-	2.92%	0.00%	-	-	0.00%	-	-	-
24	0.00%	-4.18%	100.00%	100.00%	-4.95%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	1.29%	-
37	100.00%	-	100.00%	-	-	-	-	0.43%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

Cumulative Long TermP SAT

ID	Project Trips Percent Contribution											
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
7	-	8.54%	0.00%	6.00%	9.43%	0.00%	-	-	0.00%	0.00%	-	6.98%
8	0.00%	23.02%	40.97%	0.00%	22.18%	6.40%	4.76%	16.67%	0.00%	28.57%	11.76%	0.00%
21	0.00%	7.09%	-	-	7.15%	-	-	-	-	-	-	-
24	0.00%	-8.73%	100.00%	100.00%	-8.12%	0.00%	0.00%	-	0.00%	100.00%	-	100.00%
25	-	-	100.00%	-	-	-	-	0.00%	100.00%	-	2.99%	-
37	100.00%	-	100.00%	-	-	-	-	1.15%	100.00%	100.00%	0.00%	-

Notes:

Shading indicates Project impact.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	69	314	236	914	27	85	2060
v/c Ratio	0.26	0.76	0.38	0.45	0.02	0.55	0.79
Control Delay	2.3	34.7	4.2	15.1	0.0	39.6	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	34.7	4.2	15.1	0.0	39.6	15.1
Queue Length 50th (ft)	0	105	0	101	0	30	223
Queue Length 95th (ft)	0	#212	38	138	0	#74	288
Internal Link Dist (ft)				219			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	267	463	736	2033	1247	188	2616
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.68	0.32	0.45	0.02	0.45	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	75	11	130	177	32	26	365	1148	83	2038	153
v/c Ratio	0.53	0.11	0.50	0.87	0.24	0.12	0.90	0.41	0.55	0.92	0.21
Control Delay	66.6	56.8	16.2	90.1	56.9	1.2	71.6	14.2	66.8	39.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	2.6	0.0
Total Delay	66.6	56.8	16.2	90.1	56.9	1.2	71.6	14.6	66.8	42.2	8.9
Queue Length 50th (ft)	57	8	0	138	24	0	278	164	63	534	24
Queue Length 95th (ft)	109	28	34	#278	58	0	#472	223	118	#642	69
Internal Link Dist (ft)		707			474			403		599	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	183	429	701	203	446	467	405	2832	193	2226	745
Starvation Cap Reductn	0	0	0	0	0	0	0	1013	0	109	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.03	0.19	0.87	0.07	0.06	0.90	0.63	0.43	0.96	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	14	36	154	59	101	897	157	59	2290
v/c Ratio	0.12	0.15	0.60	0.13	0.64	0.28	0.12	0.36	0.79
Control Delay	36.5	1.2	44.8	0.6	54.9	8.1	1.1	39.2	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	1.2	44.8	0.6	54.9	8.1	1.1	39.2	15.5
Queue Length 50th (ft)	7	0	38	0	48	83	0	27	312
Queue Length 95th (ft)	24	0	#74	0	#121	109	17	63	383
Internal Link Dist (ft)		586		351		599			343
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	121	494	257	603	157	3219	1293	176	2912
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.60	0.10	0.64	0.28	0.12	0.34	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	568	109	139	2195	391	335	1475
v/c Ratio	1.26	1.07	0.23	1.07	0.42	1.16	0.49
Control Delay	167.2	165.6	5.8	78.8	8.5	152.1	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.2	165.6	5.8	78.8	8.5	152.1	15.4
Queue Length 50th (ft)	~538	~101	0	~749	66	~334	242
Queue Length 95th (ft)	#768	#224	46	#842	140	#525	280
Internal Link Dist (ft)				226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	452	102	606	2053	934	288	3007
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	1.07	0.23	1.07	0.42	1.16	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	449	29	303	160	34	96	234	2345	106	1948	204
v/c Ratio	1.02	0.09	0.42	0.69	0.30	0.43	0.98	0.95	0.92	0.92	0.28
Control Delay	93.9	45.6	7.0	66.1	61.4	9.2	107.6	39.9	122.4	42.6	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.4	0.0	1.2	0.0
Total Delay	93.9	45.6	7.0	66.1	61.4	9.2	107.6	84.2	122.4	43.8	10.2
Queue Length 50th (ft)	~368	20	0	123	26	0	188	630	85	527	36
Queue Length 95th (ft)	#599	50	44	192	61	22	#363	#791	#203	#638	92
Internal Link Dist (ft)		707			482			403		594	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	441	564	1053	315	446	474	238	2471	115	2112	730
Starvation Cap Reductn	0	0	0	0	0	0	0	542	0	54	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.05	0.29	0.51	0.08	0.20	0.98	1.22	0.92	0.95	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	90	402	175	52	2421	387	154	1955
v/c Ratio	0.66	0.41	0.82	0.62	0.40	0.87	0.31	0.86	0.65
Control Delay	66.4	8.3	60.7	20.0	57.6	26.1	2.4	87.2	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.1
Total Delay	66.4	8.3	60.7	20.0	57.6	28.3	2.4	87.2	17.1
Queue Length 50th (ft)	76	0	141	11	35	504	20	106	327
Queue Length 95th (ft)	#157	19	#239	77	77	645	57	#236	431
Internal Link Dist (ft)		536		371		594			341
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	185	375	488	441	150	2778	1230	180	3011
Starvation Cap Reductn	0	0	0	0	0	229	0	0	204
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.24	0.82	0.40	0.35	0.95	0.31	0.86	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	281	120	90	1427	292	260	1374
v/c Ratio	0.83	0.78	0.22	0.78	0.29	0.91	0.46
Control Delay	34.2	65.6	4.9	21.9	2.0	64.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	65.6	4.9	21.9	2.0	64.7	7.8
Queue Length 50th (ft)	37	48	0	180	0	102	94
Queue Length 95th (ft)	#156	#129	23	231	30	#223	123
Internal Link Dist (ft)				224			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	338	153	463	1833	990	298	3015
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.78	0.19	0.78	0.29	0.87	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	306	25	219	204	35	68	219	1666	104	1513	211
v/c Ratio	0.78	0.12	0.43	0.70	0.25	0.27	0.77	0.76	0.65	0.81	0.31
Control Delay	50.0	38.0	8.3	49.1	44.1	2.6	56.8	24.4	61.7	30.9	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	50.0	38.0	8.3	49.1	44.1	2.6	56.8	24.9	61.7	30.9	7.4
Queue Length 50th (ft)	170	13	0	112	20	0	124	293	60	291	18
Queue Length 95th (ft)	#315	38	35	188	50	2	#247	368	#140	366	68
Internal Link Dist (ft)		707			455			403		593	
Turn Bay Length (ft)	185			160		160	265		305		220
Base Capacity (vph)	390	659	1146	341	584	625	284	2206	159	1859	680
Starvation Cap Reductn	0	0	0	0	0	0	0	177	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.04	0.19	0.60	0.06	0.11	0.77	0.82	0.65	0.81	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	98	477	249	57	1445	505	240	1493
v/c Ratio	0.48	0.33	0.78	0.53	0.47	0.79	0.44	0.79	0.60
Control Delay	39.2	3.1	41.4	7.0	49.4	26.3	2.2	51.6	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	3.1	41.4	7.0	49.4	26.3	2.2	51.6	16.5
Queue Length 50th (ft)	49	0	114	0	27	227	0	113	194
Queue Length 95th (ft)	98	2	#196	41	#74	302	40	#241	263
Internal Link Dist (ft)		477		344		593			344
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	281	515	617	627	121	1836	1152	306	2501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.19	0.77	0.40	0.47	0.79	0.44	0.78	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing Plus Project with Mitigation Conditions

Project Driveway Option A

Queues
8: Sierra College Blvd & Granite Dr

10/18/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	187	28	306	114	61	232	1289	65	1254	95
v/c Ratio	0.62	0.12	0.49	0.36	0.37	0.94	0.49	0.40	0.80	0.12
Control Delay	46.1	35.7	7.3	42.3	28.1	84.0	16.3	47.1	27.4	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	46.1	35.7	7.3	42.3	28.1	84.0	16.4	47.1	27.4	2.2
Queue Length 50th (ft)	102	14	0	32	15	136	183	36	327	0
Queue Length 95th (ft)	#183	40	39	59	53	#291	245	79	443	18
Internal Link Dist (ft)		707			508		403		598	
Turn Bay Length (ft)	185			60		265		305		220
Base Capacity (vph)	309	692	1226	419	574	248	2620	192	1566	766
Starvation Cap Reductn	0	0	0	0	0	0	371	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.04	0.25	0.27	0.11	0.94	0.57	0.34	0.80	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
9: Sierra College Blvd & I-80 WB Ramps

08/28/2019

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	82	120	485	248	233	289	1113	279	1564	100
v/c Ratio	0.73	0.29	0.49	0.79	0.67	1.20	0.38	0.27	0.81	0.14
Control Delay	74.9	5.2	24.9	44.3	25.7	156.4	10.1	2.1	26.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	5.2	24.9	44.3	25.7	156.4	10.1	2.1	26.8	4.4
Queue Length 50th (ft)	41	0	102	103	56	~177	99	0	247	0
Queue Length 95th (ft)	#126	24	144	186	132	#360	159	35	#365	29
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	113	407	2065	802	772	241	2927	1037	1924	692
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.29	0.23	0.31	0.30	1.20	0.38	0.27	0.81	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: Taylor Rd & King Rd

02/21/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	54	232	193	108	233	278	152	27	332
v/c Ratio	0.31	0.27	0.60	0.59	0.33	0.55	0.35	0.21	0.19	0.56
Control Delay	32.0	31.2	11.7	32.5	23.7	29.5	16.5	4.4	34.7	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	31.2	11.7	32.5	23.7	29.5	16.5	4.4	34.7	28.2
Queue Length 50th (ft)	22	19	0	67	31	76	59	0	10	58
Queue Length 95th (ft)	55	49	42	126	69	157	150	28	33	99
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	755	753	819	807	790	442	947	832	145	1147
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.07	0.28	0.24	0.14	0.53	0.29	0.18	0.19	0.29

Intersection Summary

Queues
9: Sierra College Blvd & I-80 WB Ramps

08/28/2019

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	424	292	265	354	766	255	1310	85
v/c Ratio	0.84	0.55	0.40	0.82	0.67	0.90	0.26	0.25	0.83	0.15
Control Delay	102.2	13.7	26.5	48.7	25.4	64.2	10.3	2.1	35.1	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.2	13.7	26.5	48.7	25.4	64.2	10.3	2.1	35.1	5.2
Queue Length 50th (ft)	50	38	103	152	73	208	73	0	253	0
Queue Length 95th (ft)	#155	119	144	250	163	#436	123	36	361	29
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	99	553	1836	719	694	394	3164	1072	1766	639
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.55	0.23	0.41	0.38	0.90	0.24	0.24	0.74	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
17: Granite Dr & Rocklin Rd

02/21/2019

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	203	435	23	414	444	46	39	211	214	206
v/c Ratio	0.65	0.28	0.17	0.47	0.63	0.27	0.22	0.57	0.58	0.41
Control Delay	42.4	15.9	40.9	26.8	7.2	40.5	24.9	33.5	33.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	15.9	40.9	26.8	7.2	40.5	24.9	33.5	33.6	6.8
Queue Length 50th (ft)	89	58	10	88	0	21	7	94	95	0
Queue Length 95th (ft)	#211	130	38	146	73	60	40	177	180	51
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150			325		
Base Capacity (vph)	352	1753	133	1314	837	172	181	740	743	795
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.17	0.32	0.53	0.27	0.22	0.29	0.29	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	76	25	114	166	73	234	730	93	929	89
v/c Ratio	0.51	0.12	0.28	0.57	0.33	0.92	0.32	0.44	0.67	0.13
Control Delay	45.5	28.8	8.7	40.3	23.3	73.5	11.7	36.0	18.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	28.8	8.7	40.3	23.3	73.5	11.7	36.0	18.3	2.9
Queue Length 50th (ft)	29	9	0	32	16	93	64	34	151	0
Queue Length 95th (ft)	#97	32	23	#84	55	#263	96	#89	224	19
Internal Link Dist (ft)		707			450		403		628	
Turn Bay Length (ft)	185			160		265		305		220
Base Capacity (vph)	150	870	1280	291	833	255	2739	226	1954	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.03	0.09	0.57	0.09	0.92	0.27	0.41	0.48	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	111	122	1025	124	110	835
v/c Ratio	0.41	0.35	0.28	0.67	0.16	0.81	0.39
Control Delay	3.4	22.8	2.8	18.2	2.1	72.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	22.8	2.8	18.2	2.1	72.8	8.9
Queue Length 50th (ft)	0	33	0	149	0	37	81
Queue Length 95th (ft)	0	72	13	#276	18	#123	143
Internal Link Dist (ft)			227	226			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	361	478	563	1522	787	135	2151
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.23	0.22	0.67	0.16	0.81	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	185	30	306	146	63	232	1289	65	1222	93
v/c Ratio	0.71	0.15	0.54	0.45	0.38	0.77	0.47	0.41	0.79	0.12
Control Delay	55.3	38.9	8.5	44.1	28.9	55.4	14.6	47.6	27.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	55.3	38.9	8.5	44.1	28.9	55.4	14.8	47.6	27.4	2.0
Queue Length 50th (ft)	106	16	0	41	16	130	169	36	315	0
Queue Length 95th (ft)	#223	43	40	73	55	#257	230	79	428	17
Internal Link Dist (ft)		707			523		403		648	
Turn Bay Length (ft)	185			160		265		305		220
Base Capacity (vph)	261	650	1170	361	568	301	2735	190	1542	757
Starvation Cap Reductn	0	0	0	0	0	0	483	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.05	0.26	0.40	0.11	0.77	0.57	0.34	0.79	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	97	90	734	99	95	746
v/c Ratio	0.17	0.32	0.21	0.45	0.12	0.54	0.35
Control Delay	0.9	21.1	1.2	14.4	1.1	36.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	21.1	1.2	14.4	1.1	36.3	7.8
Queue Length 50th (ft)	0	27	0	95	0	27	66
Queue Length 95th (ft)	0	62	1	157	8	#83	113
Internal Link Dist (ft)			259	226			582
Turn Bay Length (ft)		100				170	
Base Capacity (vph)	428	699	724	1626	834	198	2167
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.14	0.12	0.45	0.12	0.48	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	136	28	213	181	53	206	1023	67	982	117
v/c Ratio	0.48	0.14	0.43	0.57	0.26	0.94	0.44	0.39	0.69	0.17
Control Delay	40.1	29.6	7.9	37.7	22.0	83.2	12.2	36.7	18.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	29.6	7.9	37.7	22.0	83.2	12.2	36.7	18.5	3.3
Queue Length 50th (ft)	53	10	0	35	11	80	93	25	156	0
Queue Length 95th (ft)	#168	34	31	#82	43	#234	132	68	228	25
Internal Link Dist (ft)		707			486		403		658	
Turn Bay Length (ft)	185			160		265		305		220
Base Capacity (vph)	284	861	1427	320	813	218	2797	176	1891	898
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.03	0.15	0.57	0.07	0.94	0.37	0.38	0.52	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option C

See Option A or B as noted in study

Cumulative Conditions – Short Term Plus Project with Mitigation Measures

Project Driveway Option A

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	24	251	155	43	29	276	860	106	93	1466
v/c Ratio	0.86	0.19	0.44	0.75	0.33	0.11	0.98	0.31	0.12	0.53	0.55
Control Delay	96.6	48.5	19.3	68.2	51.6	0.9	87.5	7.6	1.7	54.6	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.6	48.5	19.3	68.2	51.6	0.9	87.5	7.6	1.7	54.6	17.3
Queue Length 50th (ft)	77	16	51	94	28	0	~220	78	0	60	221
Queue Length 95th (ft)	#182	41	65	#249	62	0	#373	137	8	108	282
Internal Link Dist (ft)		707			532			403			593
Turn Bay Length (ft)	185			60		150	265			305	
Base Capacity (vph)	133	498	576	208	503	550	282	2801	871	211	2660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	2	0	0	0	0	0	0	0	106
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.05	0.44	0.75	0.09	0.05	0.98	0.31	0.12	0.44	0.57

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	22	98	695	78	363	119	971	216	1813	69
v/c Ratio	0.26	0.48	0.82	0.20	0.51	0.74	0.31	0.22	0.71	0.07
Control Delay	56.0	19.0	45.1	35.5	18.4	62.1	4.9	0.5	11.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	19.0	45.1	35.5	18.4	62.1	4.9	0.5	11.2	0.1
Queue Length 50th (ft)	15	7	227	41	49	42	39	0	143	0
Queue Length 95th (ft)	41	53	269	84	100	m#85	65	2	167	m0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530	740		740	200		325		150
Base Capacity (vph)	85	206	1586	691	1113	160	3150	996	2553	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	2	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.48	0.44	0.11	0.33	0.74	0.31	0.22	0.71	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Sierra College Blvd & Taylor Rd

02/21/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	212	317	204	548	340	49	181	1283	513	26	865	181
v/c Ratio	0.89	0.78	0.30	1.01	0.73	0.10	0.80	0.86	0.47	0.31	0.88	0.22
Control Delay	80.1	49.8	12.7	82.9	43.7	0.4	67.5	34.4	6.7	55.4	45.6	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	49.8	12.7	82.9	43.7	0.4	67.5	34.4	6.7	55.4	45.6	3.2
Queue Length 50th (ft)	136	187	49	~195	195	0	113	358	60	16	280	0
Queue Length 95th (ft)	#269	#282	98	#295	290	0	#217	#577	161	44	#386	35
Internal Link Dist (ft)		429			1915			582			355	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	237	452	701	544	511	543	239	1497	1090	85	986	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.70	0.29	1.01	0.67	0.09	0.76	0.86	0.47	0.31	0.88	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	210	28	391	114	26	35	381	2042	65	1998
v/c Ratio	0.55	0.27	0.47	0.29	0.26	0.18	0.88	0.72	0.49	1.07
Control Delay	54.7	66.8	26.9	47.2	66.8	2.1	70.7	22.9	71.2	84.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	12.1
Total Delay	54.7	66.8	26.9	47.2	66.8	2.1	70.7	23.4	71.2	96.2
Queue Length 50th (ft)	170	24	82	87	22	0	339	414	56	~710
Queue Length 95th (ft)	254	57	114	147	53	0	#550	417	104	#806
Internal Link Dist (ft)		707			573			403		593
Turn Bay Length (ft)	185			160		160	265		305	
Base Capacity (vph)	380	433	830	395	406	426	434	2840	137	1862
Starvation Cap Reductn	0	0	0	0	0	0	0	377	0	8
Spillback Cap Reductn	0	0	3	0	0	0	0	0	0	415
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.06	0.47	0.29	0.06	0.08	0.88	0.83	0.47	1.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	213	327	591	146	511	445	1744	417	2136	222
v/c Ratio	0.63	0.65	0.43	0.43	0.87	1.30	0.68	0.41	1.16	0.33
Control Delay	60.6	26.6	29.8	51.8	57.1	189.4	18.7	2.3	93.2	3.4
Queue Delay	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	62.0	26.6	29.8	51.8	57.1	189.4	18.7	2.3	93.3	3.4
Queue Length 50th (ft)	175	121	191	115	197	~256	247	0	~778	3
Queue Length 95th (ft)	#326	#188	236	170	252	m#323	m348	m35	m#749	m5
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530				200		325		150
Base Capacity (vph)	340	506	1420	538	864	341	2572	1012	1847	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	73	0
Spillback Cap Reductn	36	0	0	0	2	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.65	0.42	0.27	0.59	1.30	0.68	0.41	1.20	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
2: Taylor Rd & Horseshoe Bar Rd

10/12/2019

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	116	295	17	688	98	356	811
v/c Ratio	0.15	0.49	0.45	0.12	0.85	0.13	0.80	0.59
Control Delay	20.7	33.1	10.3	32.1	30.6	2.1	41.1	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	33.1	10.3	32.1	30.6	2.1	41.1	10.1
Queue Length 50th (ft)	10	44	49	7	246	0	139	126
Queue Length 95th (ft)	31	87	95	25	#475	15	#291	#423
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)			160	100		125	190	
Base Capacity (vph)	508	434	679	163	877	773	468	1335
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.27	0.43	0.10	0.78	0.13	0.76	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
6: Sierra College Blvd & Taylor Rd

02/21/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	148	229	188	589	204	26	191	859	553	31	852	131
v/c Ratio	0.63	0.63	0.28	0.86	0.43	0.05	0.86	0.64	0.50	0.32	0.90	0.18
Control Delay	51.3	43.0	7.3	51.8	33.1	0.2	76.5	28.0	4.4	53.9	48.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	43.0	7.3	51.8	33.1	0.2	76.5	28.0	4.4	53.9	48.1	1.9
Queue Length 50th (ft)	84	127	20	176	103	0	114	233	36	18	259	0
Queue Length 95th (ft)	151	202	63	#290	174	0	#254	331	98	50	#408	16
Internal Link Dist (ft)		429			1915			582			326	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	298	480	682	690	529	585	221	1341	1098	96	946	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.48	0.28	0.85	0.39	0.04	0.86	0.64	0.50	0.32	0.90	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	166	24	310	123	25	24	314	1850	67	2013
v/c Ratio	0.79	0.20	0.48	0.54	0.25	0.11	1.31	0.57	0.49	0.71
Control Delay	80.3	60.7	17.9	62.7	64.1	1.1	202.8	15.2	68.2	23.0
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	2.8
Total Delay	80.3	60.7	18.0	62.7	64.1	1.1	202.8	15.3	68.2	25.8
Queue Length 50th (ft)	136	19	46	102	21	0	~338	289	55	456
Queue Length 95th (ft)	#234	48	80	165	50	0	m#480	m326	102	537
Internal Link Dist (ft)		707			491			403		592
Turn Bay Length (ft)	185			60		150	265		305	
Base Capacity (vph)	232	427	647	252	405	469	240	3237	156	2853
Starvation Cap Reductn	0	0	0	0	0	0	0	288	0	452
Spillback Cap Reductn	0	0	21	0	0	0	0	0	0	702
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.06	0.50	0.49	0.06	0.05	1.31	0.63	0.43	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
9: Sierra College Blvd & I-80 WB Ramps

02/21/2019

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	255	573	628	208	510	594	1420	435	2045	272
v/c Ratio	1.48	1.29	0.57	0.59	0.87	1.54	0.47	0.39	0.92	0.35
Control Delay	285.4	182.9	38.4	54.6	54.3	292.8	13.8	1.9	27.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0
Total Delay	285.4	182.9	38.4	54.6	54.3	292.8	13.8	1.9	32.1	7.3
Queue Length 50th (ft)	~296	~566	227	163	188	~366	194	0	300	7
Queue Length 95th (ft)	#469	#795	259	227	242	m#458	m279	m18	#782	m65
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			220		180	200		325		150
Base Capacity (vph)	172	443	1489	564	878	385	3023	1108	2215	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0	125	0
Spillback Cap Reductn	0	0	0	0	4	0	237	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.48	1.29	0.42	0.37	0.58	1.54	0.51	0.39	0.98	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
17: Granite Dr & Rocklin Rd

02/21/2019

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	297	795	23	769	536	46	39	254	251	290
v/c Ratio	0.83	0.46	0.21	0.77	0.73	0.34	0.26	0.65	0.64	0.50
Control Delay	57.6	18.6	50.1	37.7	14.0	51.2	29.9	40.8	40.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	18.6	50.1	37.7	14.0	51.2	29.9	40.8	40.4	6.7
Queue Length 50th (ft)	171	140	13	221	50	27	9	146	144	0
Queue Length 95th (ft)	#351	278	42	#336	200	68	44	229	227	60
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150			325		
Base Capacity (vph)	379	1747	108	1050	747	137	149	591	594	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.46	0.21	0.73	0.72	0.34	0.26	0.43	0.42	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	542	249	1500	574	240	1624
v/c Ratio	0.66	0.44	0.79	0.50	0.72	0.73
Control Delay	27.8	6.0	23.8	4.8	39.4	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	6.0	23.8	4.8	39.4	11.5
Queue Length 50th (ft)	106	0	216	52	96	230
Queue Length 95th (ft)	154	50	#278	107	#181	311
Internal Link Dist (ft)	372		592			347
Turn Bay Length (ft)	150	150		160	190	
Base Capacity (vph)	904	600	1906	1185	375	2227
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.41	0.79	0.48	0.64	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

26: Sierra College Boulevard/Sierra College Blvd & SR 193

10/17/2019

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	248	414	437	220	444	196	20
v/c Ratio	0.69	0.64	0.91	0.27	0.85	0.25	0.19
Control Delay	38.4	8.2	43.1	14.4	42.3	4.1	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	8.2	43.1	14.4	42.3	4.1	25.9
Queue Length 50th (ft)	112	0	153	65	201	15	3
Queue Length 95th (ft)	165	43	#233	98	270	30	21
Internal Link Dist (ft)	684			870	10501		1542
Turn Bay Length (ft)		600	465			40	
Base Capacity (vph)	435	690	481	879	601	787	107
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.60	0.91	0.25	0.74	0.25	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option B

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	25	251	166	73	276	966	93	1454
v/c Ratio	0.76	0.19	0.38	0.48	0.49	0.88	0.33	0.56	0.56
Control Delay	83.1	53.5	18.1	55.8	46.6	71.9	9.8	63.8	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	53.5	18.1	55.8	46.6	71.9	9.8	63.8	21.6
Queue Length 50th (ft)	87	18	42	64	35	216	128	70	284
Queue Length 95th (ft)	#177	46	67	101	82	#343	186	121	358
Internal Link Dist (ft)		707			424		403		608
Turn Bay Length (ft)	185			160		265		305	
Base Capacity (vph)	156	438	687	359	429	334	2910	198	2608
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	1	0	0	0	0	0	76
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.06	0.37	0.46	0.17	0.83	0.33	0.47	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	22	98	695	78	363	119	971	216	1813	69
v/c Ratio	0.29	0.44	0.84	0.22	0.53	0.62	0.30	0.21	0.69	0.07
Control Delay	66.0	21.6	52.9	42.5	20.2	62.6	6.3	0.7	10.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	21.6	52.9	42.5	20.2	62.6	6.3	0.7	10.9	0.2
Queue Length 50th (ft)	17	14	265	54	58	47	61	0	150	0
Queue Length 95th (ft)	45	67	311	94	106	m#98	89	8	143	m1
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			220		180	200		325		150
Base Capacity (vph)	75	225	1388	605	1008	191	3251	1021	2632	969
Starvation Cap Reductn	0	0	0	0	0	0	0	0	12	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.44	0.50	0.13	0.36	0.62	0.30	0.21	0.69	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	148	178	162	1709	199	120	1380
v/c Ratio	0.67	0.57	0.40	0.78	0.18	0.81	0.68
Control Delay	22.8	33.2	8.4	21.1	0.8	72.1	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.2	8.4	21.1	0.8	72.1	13.5
Queue Length 50th (ft)	0	74	3	226	0	52	202
Queue Length 95th (ft)	#70	134	49	317	8	#148	318
Internal Link Dist (ft)			224	226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	220	433	505	2183	1192	153	2026
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.41	0.32	0.78	0.17	0.78	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	207	30	391	146	63	381	2042	65	1964
v/c Ratio	1.20	0.22	0.53	0.44	0.48	1.12	0.63	0.34	0.73
Control Delay	184.5	61.1	32.4	63.5	43.2	130.1	12.0	61.8	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6
Total Delay	184.5	61.1	32.4	63.5	43.2	130.1	12.1	61.8	27.4
Queue Length 50th (ft)	~221	25	115	65	24	~389	476	51	479
Queue Length 95th (ft)	#385	56	152	102	71	m#565	m217	#127	578
Internal Link Dist (ft)		707			559		403		618
Turn Bay Length (ft)	185			160		265		305	
Base Capacity (vph)	172	443	732	330	393	341	3231	195	2695
Starvation Cap Reductn	0	0	0	0	0	0	269	0	0
Spillback Cap Reductn	0	0	2	0	0	0	0	0	341
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.07	0.54	0.44	0.16	1.12	0.69	0.33	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	213	327	591	146	511	445	1744	417	2136	222
v/c Ratio	1.30	0.80	0.56	0.43	0.88	1.31	0.57	0.37	0.92	0.27
Control Delay	218.8	54.1	40.7	52.0	57.9	203.8	14.9	1.6	27.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Total Delay	218.8	54.1	40.7	52.0	58.0	203.8	14.9	1.6	30.1	6.1
Queue Length 50th (ft)	~240	218	225	116	201	~262	271	0	410	10
Queue Length 95th (ft)	#405	#364	258	170	255	m#357	m361	m14	#832	m38
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			220		180	200		325		150
Base Capacity (vph)	164	409	1410	534	856	339	3063	1126	2328	815
Starvation Cap Reductn	0	0	0	0	0	0	0	0	122	0
Spillback Cap Reductn	0	0	0	0	3	0	166	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.80	0.42	0.27	0.60	1.31	0.60	0.37	0.97	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	72	156	149	1490	196	105	1491
v/c Ratio	0.25	0.45	0.31	0.76	0.17	0.73	0.77
Control Delay	2.1	24.2	3.3	19.8	1.0	61.7	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	24.2	3.3	19.8	1.0	61.7	16.0
Queue Length 50th (ft)	0	51	0	166	0	37	211
Queue Length 95th (ft)	0	100	21	#289	14	#125	#423
Internal Link Dist (ft)			229	226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	285	562	645	1973	1148	143	1934
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.28	0.23	0.76	0.17	0.73	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	28	310	181	53	314	1850	67	1950
v/c Ratio	0.78	0.18	0.42	0.48	0.42	0.99	0.61	0.33	0.74
Control Delay	80.3	55.4	27.0	59.4	45.7	97.9	16.1	58.2	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7
Total Delay	80.3	55.4	27.1	59.4	45.7	97.9	16.2	58.2	28.3
Queue Length 50th (ft)	132	22	76	76	24	278	490	50	479
Queue Length 95th (ft)	#228	52	106	115	66	m#424	m263	105	576
Internal Link Dist (ft)		707			531		403		668
Turn Bay Length (ft)	185			160		265		305	
Base Capacity (vph)	227	421	733	382	345	317	3037	213	2621
Starvation Cap Reductn	0	0	0	0	0	0	225	0	0
Spillback Cap Reductn	0	0	2	0	0	0	0	0	315
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.07	0.42	0.47	0.15	0.99	0.66	0.31	0.85

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	255	573	628	208	510	594	1420	435	2045	272
v/c Ratio	1.48	1.29	0.57	0.59	0.87	1.54	0.47	0.39	0.92	0.35
Control Delay	285.4	182.9	38.4	54.6	54.3	292.8	13.8	1.9	27.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0
Total Delay	285.4	182.9	38.4	54.6	54.3	292.8	13.8	1.9	32.1	7.3
Queue Length 50th (ft)	~296	~566	227	163	188	~366	194	0	300	7
Queue Length 95th (ft)	#469	#795	259	227	242	m#458	m279	m18	#782	m65
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			17		180	200		325		150
Base Capacity (vph)	172	443	1489	564	878	385	3023	1108	2215	784
Starvation Cap Reductn	0	0	0	0	0	0	0	0	125	0
Spillback Cap Reductn	0	0	0	0	4	0	237	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.48	1.29	0.42	0.37	0.58	1.54	0.51	0.39	0.98	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Project Driveway Option C

See Option A or B as noted in study

Cumulative Conditions – Long Term Plus Project with Mitigation Measures

Project Driveway Option A

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	76	71	69	167	31	26	365	1148	83	2048	154
v/c Ratio	0.39	0.53	0.39	1.04	0.22	0.12	1.36	0.37	0.58	0.71	0.17
Control Delay	71.0	33.9	7.7	142.7	64.6	1.0	221.2	8.3	79.0	24.3	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.2	0.0
Total Delay	71.0	33.9	7.7	142.7	64.6	1.0	221.2	8.5	79.0	27.4	6.7
Queue Length 50th (ft)	36	9	0	~169	28	0	~489	87	77	461	25
Queue Length 95th (ft)	62	63	9	#323	62	0	#700	205	131	571	63
Internal Link Dist (ft)		707			562			403		599	
Turn Bay Length (ft)	185			60		150	265		305		220
Base Capacity (vph)	300	331	363	161	364	407	269	3091	170	2874	929
Starvation Cap Reductn	0	0	0	0	0	0	0	835	0	704	0
Spillback Cap Reductn	0	2	5	0	0	0	0	0	0	263	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.22	0.19	1.04	0.09	0.06	1.36	0.51	0.49	0.94	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	71	799	252	245	87	1136	163	2392	54
v/c Ratio	0.08	0.53	0.89	0.55	0.54	0.71	0.35	0.16	0.88	0.05
Control Delay	70.6	31.5	63.5	30.8	25.0	69.4	2.1	0.4	13.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	31.5	63.5	30.8	25.0	69.4	2.1	0.4	13.6	0.1
Queue Length 50th (ft)	5	7	375	121	91	43	8	0	703	0
Queue Length 95th (ft)	20	56	426	223	191	m#84	47	6	m#863	m0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530				200		325		150
Base Capacity (vph)	67	135	1174	495	492	123	3223	996	2733	993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.53	0.68	0.51	0.50	0.71	0.35	0.16	0.88	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Sierra College Blvd & Taylor Rd

02/21/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	147	348	283	564	207	76	164	1620	624	38	1042	76
v/c Ratio	0.67	0.94	0.45	1.03	0.46	0.16	0.76	1.03	0.58	0.54	0.87	0.09
Control Delay	65.1	80.7	23.7	94.0	43.7	0.7	72.6	64.2	11.5	84.1	45.6	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3	0.7	0.0	0.0	0.0
Total Delay	65.1	80.7	23.7	94.0	43.7	0.7	72.6	87.5	12.2	84.1	45.6	1.4
Queue Length 50th (ft)	110	269	123	~243	139	0	123	~718	196	30	397	0
Queue Length 95th (ft)	176	#453	203	#356	223	0	#214	#858	302	#81	#494	12
Internal Link Dist (ft)		429			1915			582			4602	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	272	371	650	550	452	478	240	1572	1069	70	1223	877
Starvation Cap Reductn	0	0	0	0	0	0	0	86	175	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.94	0.44	1.03	0.46	0.16	0.68	1.09	0.70	0.54	0.85	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	451	166	164	128	32	96	234	2346	106	1980	206
v/c Ratio	0.79	0.56	0.53	0.70	0.33	0.45	1.14	0.75	1.13	0.71	0.22
Control Delay	70.5	21.8	14.3	84.8	76.3	9.5	143.0	12.3	174.5	24.5	7.1
Queue Delay	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0
Total Delay	70.5	21.8	14.4	84.8	76.3	9.5	143.0	12.5	174.5	24.8	7.1
Queue Length 50th (ft)	221	25	0	123	31	0	~267	189	~122	450	50
Queue Length 95th (ft)	272	103	72	192	67	19	#444	616	m#190	m466	m84
Internal Link Dist (ft)		707			448			403		594	
Turn Bay Length (ft)	185			60		150	265		305		220
Base Capacity (vph)	747	532	538	224	365	415	206	3119	94	2794	925
Starvation Cap Reductn	0	0	0	0	0	0	0	133	0	305	0
Spillback Cap Reductn	0	24	25	0	0	0	0	0	0	277	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.33	0.32	0.57	0.09	0.23	1.14	0.79	1.13	0.80	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	37	128	1101	249	242	324	2094	271	2373	37
v/c Ratio	0.61	0.52	0.99	0.57	0.51	1.35	0.69	0.26	0.97	0.04
Control Delay	108.9	39.3	74.5	49.0	30.9	217.8	12.8	0.7	27.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	108.9	39.3	74.5	49.0	31.0	217.8	12.9	0.7	27.1	0.1
Queue Length 50th (ft)	36	59	553	205	123	~216	298	0	625	0
Queue Length 95th (ft)	#94	130	#705	308	220	m#298	m313	m1	#750	m0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530				200		325		150
Base Capacity (vph)	61	245	1112	440	473	240	3014	1056	2439	844
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	2	0	147	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.52	0.99	0.57	0.51	1.35	0.73	0.26	0.97	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	90	437	175	52	2421	421	154	1955
v/c Ratio	0.82	0.31	1.14	0.56	0.29	1.23	0.41	0.45	0.72
Control Delay	77.6	4.1	127.0	13.4	35.3	130.2	4.0	32.2	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.6	4.1	127.0	13.4	35.3	130.2	4.0	32.2	17.9
Queue Length 50th (ft)	53	0	~146	3	31	~660	38	64	254
Queue Length 95th (ft)	#141	10	#233	53	m49	#847	81	123	#444
Internal Link Dist (ft)		536		371		594			341
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	139	496	383	519	180	1971	1036	341	2709
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.18	1.14	0.34	0.29	1.23	0.41	0.45	0.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
1: Taylor Rd & King Rd

02/21/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	93	105	360	152	74	335	437	319	37	302
v/c Ratio	0.37	0.42	0.67	0.53	0.25	1.09	0.58	0.40	0.42	0.40
Control Delay	30.7	31.8	10.4	33.5	21.3	111.0	20.7	4.0	50.7	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	31.8	10.4	33.5	21.3	111.0	20.7	4.0	50.7	22.3
Queue Length 50th (ft)	33	37	0	54	17	~152	132	0	14	47
Queue Length 95th (ft)	72	80	44	110	50	#339	242	34	#53	85
Internal Link Dist (ft)		587			904		408			324
Turn Bay Length (ft)	65		150	95		200		350	280	
Base Capacity (vph)	773	771	901	826	801	307	877	871	89	1177
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.14	0.40	0.18	0.09	1.09	0.50	0.37	0.42	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
2: Taylor Rd & Horseshoe Bar Rd

02/21/2019

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	114	313	23	677	136	460	588
v/c Ratio	0.17	0.50	0.44	0.16	0.89	0.20	0.91	0.45
Control Delay	20.8	33.8	10.1	33.0	37.5	4.5	49.6	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	33.8	10.1	33.0	37.5	4.5	49.6	8.5
Queue Length 50th (ft)	11	44	54	9	257	1	184	75
Queue Length 95th (ft)	33	86	100	31	#494	32	#375	246
Internal Link Dist (ft)	142	528			1160			350
Turn Bay Length (ft)			160	100		125	190	
Base Capacity (vph)	481	405	704	154	759	687	508	1315
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.28	0.44	0.15	0.89	0.20	0.91	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
6: Sierra College Blvd & Taylor Rd

02/21/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	234	283	567	181	37	190	801	581	43	818	43
v/c Ratio	0.53	0.64	0.40	0.87	0.31	0.06	0.73	0.59	0.52	0.44	0.93	0.06
Control Delay	54.6	43.4	11.8	53.2	27.6	0.2	55.5	26.1	6.8	59.9	53.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	43.4	11.8	53.2	27.6	0.2	55.5	26.1	6.8	59.9	53.9	0.1
Queue Length 50th (ft)	49	131	60	174	87	0	109	210	79	26	257	0
Queue Length 95th (ft)	102	210	121	#288	146	0	#203	293	183	#69	#409	0
Internal Link Dist (ft)		429			1915			582			6350	
Turn Bay Length (ft)	150		250	215		215	210			210		450
Base Capacity (vph)	179	467	748	655	637	660	303	1362	1121	97	878	746
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.50	0.38	0.87	0.28	0.06	0.63	0.59	0.52	0.44	0.93	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	310	122	118	146	31	68	219	1666	104	1571	216
v/c Ratio	0.68	0.61	0.56	0.74	0.33	0.34	0.79	0.59	0.40	0.57	0.24
Control Delay	69.9	30.6	20.7	86.7	76.7	4.6	73.4	15.1	69.9	24.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0
Total Delay	69.9	30.6	20.7	86.7	76.7	4.6	73.4	15.2	69.9	25.1	9.6
Queue Length 50th (ft)	152	21	0	140	30	0	217	200	93	381	53
Queue Length 95th (ft)	199	90	66	215	65	1	315	318	m163	416	m93
Internal Link Dist (ft)		707			465			403		593	
Turn Bay Length (ft)	185			60		150	265		305		220
Base Capacity (vph)	468	389	395	233	351	419	312	2808	263	2743	916
Starvation Cap Reductn	0	0	0	0	0	0	0	221	0	473	0
Spillback Cap Reductn	0	5	6	0	0	0	0	0	0	292	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.32	0.30	0.63	0.09	0.16	0.70	0.64	0.40	0.69	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

9: Sierra College Blvd & I-80 WB Ramps

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	1135	297	273	417	1518	250	1883	26
v/c Ratio	0.40	0.70	0.97	0.89	0.76	0.93	0.51	0.24	0.90	0.03
Control Delay	69.0	34.4	68.4	79.5	47.7	79.9	10.8	0.6	21.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.0	34.4	68.4	79.5	47.7	79.9	10.8	0.6	21.7	0.1
Queue Length 50th (ft)	76	135	556	274	169	215	224	5	519	0
Queue Length 95th (ft)	#182	#314	#695	366	263	m#307	194	m0	166	m0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)	530	530				200		325		150
Base Capacity (vph)	206	437	1199	441	449	457	2975	1021	2106	744
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	1	0	70	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.69	0.95	0.67	0.61	0.91	0.52	0.24	0.89	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
17: Granite Dr & Rocklin Rd

02/21/2019

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	354	804	27	537	548	53	48	222	225	236
v/c Ratio	0.82	0.45	0.24	0.60	0.69	0.38	0.31	0.62	0.63	0.46
Control Delay	51.1	17.3	51.3	34.5	8.1	53.2	31.3	41.7	41.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	17.3	51.3	34.5	8.1	53.2	31.3	41.7	41.9	7.3
Queue Length 50th (ft)	198	134	16	149	0	31	12	129	131	0
Queue Length 95th (ft)	#395	269	47	228	97	77	52	213	215	59
Internal Link Dist (ft)		1407		615			195		589	
Turn Bay Length (ft)	225		135		150			325		
Base Capacity (vph)	487	1874	116	1074	838	140	156	604	607	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.43	0.23	0.50	0.65	0.38	0.31	0.37	0.37	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	98	542	249	57	1445	574	240	1493
v/c Ratio	0.36	0.30	0.80	0.55	0.38	0.87	0.53	0.73	0.61
Control Delay	30.6	2.4	40.0	5.5	38.0	33.7	5.3	42.7	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	2.4	40.0	5.5	38.0	33.7	5.3	42.7	17.0
Queue Length 50th (ft)	44	0	127	0	40	258	42	103	201
Queue Length 95th (ft)	88	0	#210	12	m59	#405	146	#182	263
Internal Link Dist (ft)		477		344		593			344
Turn Bay Length (ft)			150				160	190	
Base Capacity (vph)	301	370	679	627	155	1658	1091	365	2443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.26	0.80	0.40	0.37	0.87	0.53	0.66	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Project Driveway Option B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	75	11	130	177	58	365	1148	83	2038	153
v/c Ratio	0.69	0.11	0.18	0.44	0.44	0.83	0.37	0.55	0.83	0.19
Control Delay	87.5	56.6	13.7	53.3	44.4	60.5	10.7	66.8	31.4	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.5	0.0
Total Delay	87.5	56.6	13.7	53.3	44.4	60.5	11.0	66.8	31.9	9.5
Queue Length 50th (ft)	59	8	18	64	25	274	143	63	502	29
Queue Length 95th (ft)	#144	28	33	#135	69	#457	199	118	606	73
Internal Link Dist (ft)		707			411		403		628	
Turn Bay Length (ft)	185			160		265		305		220
Base Capacity (vph)	109	434	727	401	438	438	3129	195	2441	800
Starvation Cap Reductn	0	0	0	0	0	0	1191	0	111	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.03	0.18	0.44	0.13	0.83	0.59	0.43	0.87	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
9: Sierra College Blvd & I-80 WB Ramps

02/21/2019

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	5	71	799	60	437	87	1136	163	2392	54
v/c Ratio	0.08	0.54	0.89	0.13	0.52	0.75	0.35	0.16	0.87	0.05
Control Delay	70.6	32.3	63.9	42.4	23.4	86.0	4.8	0.4	30.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.4	0.0
Total Delay	70.6	32.3	63.9	42.4	23.4	86.0	4.8	0.4	76.6	0.2
Queue Length 50th (ft)	5	7	376	44	90	43	50	0	670	0
Queue Length 95th (ft)	20	56	426	85	155	m#88	107	3	#849	2
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			220		180	200		325		150
Base Capacity (vph)	62	132	1148	506	890	116	3226	997	2744	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	681	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.54	0.70	0.12	0.49	0.75	0.35	0.16	1.16	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	568	104	147	2198	394	335	1475
v/c Ratio	1.33	0.56	0.52	1.13	0.42	1.25	0.52
Control Delay	194.8	64.9	17.2	103.9	4.7	181.0	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	194.8	64.9	17.2	103.9	4.7	181.0	17.9
Queue Length 50th (ft)	~536	86	9	~774	32	~344	261
Queue Length 95th (ft)	#784	149	76	#901	63	#549	320
Internal Link Dist (ft)			199	226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	428	240	329	1938	977	269	2845
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.33	0.43	0.45	1.13	0.40	1.25	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	449	29	303	160	130	234	2345	106	1948	204
v/c Ratio	1.17	0.11	0.42	0.29	0.69	1.14	0.84	1.13	0.79	0.25
Control Delay	149.9	49.5	32.1	61.3	43.8	147.9	19.5	191.8	36.0	9.5
Queue Delay	0.0	0.0	1.0	0.0	0.0	0.0	0.4	0.0	3.2	0.0
Total Delay	149.9	49.5	33.1	61.3	43.8	147.9	19.9	191.8	39.2	9.5
Queue Length 50th (ft)	~520	23	86	78	43	~272	636	~119	568	38
Queue Length 95th (ft)	#741	50	111	119	112	#455	823	#249	694	97
Internal Link Dist (ft)		707			466		403		618	
Turn Bay Length (ft)	185			160		265		305		220
Base Capacity (vph)	385	602	717	553	388	206	2784	94	2461	831
Starvation Cap Reductn	0	0	0	0	0	0	109	0	405	0
Spillback Cap Reductn	0	0	212	0	0	0	0	0	132	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.17	0.05	0.60	0.29	0.34	1.14	0.88	1.13	0.95	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
9: Sierra College Blvd & I-80 WB Ramps

02/21/2019

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	37	128	1101	249	242	324	2094	271	2373	37
v/c Ratio	0.62	0.45	0.99	0.57	0.51	0.98	0.69	0.26	1.03	0.05
Control Delay	110.3	34.8	75.0	49.0	30.9	107.2	19.1	1.7	47.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0
Total Delay	110.3	34.8	75.0	49.0	31.0	107.2	19.7	1.7	47.3	0.8
Queue Length 50th (ft)	36	58	554	205	123	166	420	0	~898	0
Queue Length 95th (ft)	#95	126	#706	308	220	m#262	m471	m23	#971	m1
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			220		180	200		325		150
Base Capacity (vph)	60	285	1110	440	472	330	3018	1057	2312	805
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1	9	0	487	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.45	0.99	0.57	0.52	0.98	0.83	0.26	1.03	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

7: Sierra College Blvd & Brace Rd

Lane Group	EBR	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	281	112	103	1433	298	260	1374
v/c Ratio	0.88	0.46	0.33	0.80	0.31	0.86	0.47
Control Delay	46.1	38.4	6.8	29.4	1.6	59.4	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	38.4	6.8	29.4	1.6	59.4	10.8
Queue Length 50th (ft)	58	56	0	245	0	129	132
Queue Length 95th (ft)	#217	109	30	#370	20	#262	199
Internal Link Dist (ft)			199	226			582
Turn Bay Length (ft)		100			200	170	
Base Capacity (vph)	318	383	421	1781	1065	369	3098
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.29	0.24	0.80	0.28	0.70	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Sierra College Blvd & Granite Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	306	25	219	204	103	219	1666	104	1513	211
v/c Ratio	0.81	0.12	0.31	0.24	0.51	0.79	0.79	0.63	0.84	0.31
Control Delay	53.4	34.9	16.5	32.2	25.9	60.0	26.6	59.7	33.0	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	53.4	34.9	16.5	32.2	25.9	60.0	27.2	59.7	33.0	7.2
Queue Length 50th (ft)	171	14	48	42	20	125	293	60	292	15
Queue Length 95th (ft)	#325	35	43	96	69	#254	384	#143	380	67
Internal Link Dist (ft)		707			437		403		597	
Turn Bay Length (ft)	185			160		265		305		220
Base Capacity (vph)	377	745	704	854	584	276	2146	166	1807	670
Starvation Cap Reductn	0	0	0	0	0	0	175	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.03	0.31	0.24	0.18	0.79	0.85	0.63	0.84	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
9: Sierra College Blvd & I-80 WB Ramps

02/21/2019

Lane Group	EBL	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	83	302	1135	297	273	417	1518	250	1883	26
v/c Ratio	0.39	0.70	0.92	0.86	0.71	1.03	0.54	0.26	0.95	0.04
Control Delay	58.4	28.9	51.0	66.1	34.3	103.3	15.4	1.2	49.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.8	0.0
Total Delay	58.4	28.9	51.0	66.1	34.3	103.3	15.4	1.2	92.8	0.1
Queue Length 50th (ft)	63	103	448	227	121	~189	221	0	545	0
Queue Length 95th (ft)	#128	#221	515	309	204	m#286	m283	m9	#712	0
Internal Link Dist (ft)				575			369		403	
Turn Bay Length (ft)			220		180	200		325		150
Base Capacity (vph)	214	429	1367	519	529	403	2810	978	1977	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	312	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.70	0.83	0.57	0.52	1.03	0.54	0.26	1.13	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

24: Sierra College Blvd & Project Driveway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	98	477	262	57	1571	505	253	1609
v/c Ratio	0.47	0.34	0.80	0.51	0.46	0.91	0.47	0.72	0.64
Control Delay	38.3	3.3	42.2	4.5	47.8	34.6	3.8	41.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	3.3	42.2	4.5	47.8	34.6	3.8	41.6	16.4
Queue Length 50th (ft)	49	0	115	0	27	271	21	113	212
Queue Length 95th (ft)	94	2	#194	16	#71	#383	71	#207	268
Internal Link Dist (ft)		477		344		597			338
Turn Bay Length (ft)					160		130	190	
Base Capacity (vph)	288	524	600	677	124	1723	1083	395	2522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.19	0.80	0.39	0.46	0.91	0.47	0.64	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Project Driveway Option C

See Option A or B as noted in study

Appendix D:Simulation Worksheets (SimTraffic)

Existing Conditions

6: Sierra College Blvd & Taylor Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.6	0.6	0.5	0.6	0.6	0.6
Denied Del/Veh (s)	1.0	1.0	0.9	1.0	1.0	1.0
Total Delay (hr)	24.0	32.2	19.0	21.4	25.9	24.5
Total Del/Veh (s)	39.0	55.1	34.2	36.8	44.8	42.0
Stop Del/Veh (s)	28.4	42.1	25.4	27.6	33.4	31.4

7: Sierra College Blvd & Brace Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.3	0.3	0.3	0.3	0.3	0.3
Total Delay (hr)	5.1	4.6	4.5	4.5	4.6	4.7
Total Del/Veh (s)	9.9	9.2	9.7	9.5	9.5	9.6
Stop Del/Veh (s)	6.0	5.3	5.9	5.7	6.0	5.8

8: Sierra College Blvd & Granite Dr Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.2	0.2
Total Delay (hr)	11.4	11.4	10.0	10.5	11.7	11.0
Total Del/Veh (s)	17.4	18.0	16.7	17.3	19.0	17.7
Stop Del/Veh (s)	12.6	12.9	12.1	12.8	14.1	12.9

9: Sierra College Blvd & I-80 WB Ramps Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.2	0.2	0.2	0.2	0.2	0.2
Denied Del/Veh (s)	0.2	0.3	0.3	0.3	0.3	0.3
Total Delay (hr)	10.6	13.6	11.1	10.7	11.8	11.6
Total Del/Veh (s)	12.8	16.2	13.7	13.2	14.3	14.1
Stop Del/Veh (s)	8.1	11.2	9.2	8.7	9.7	9.4

10: Sierra College Blvd & I-80 EB Ramps Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.4	0.4	0.4	0.4	0.5	0.4
Denied Del/Veh (s)	0.6	0.5	0.5	0.6	0.6	0.6
Total Delay (hr)	8.6	8.4	8.2	8.8	8.8	8.5
Total Del/Veh (s)	10.9	10.3	10.3	11.0	10.9	10.7
Stop Del/Veh (s)	7.0	6.6	6.7	7.2	7.1	6.9

11: Sierra College Blvd & Schriber Way Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.2	1.1	1.1	1.2	1.1	1.1
Total Del/Veh (s)	2.1	1.9	1.9	2.0	1.8	2.0
Stop Del/Veh (s)	0.3	0.3	0.3	0.3	0.3	0.3

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.1	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1
Total Delay (hr)	1.5	1.4	1.5	1.6	1.5	1.5
Total Del/Veh (s)	2.7	2.5	2.7	2.8	2.7	2.7
Stop Del/Veh (s)	1.1	0.9	1.1	1.0	1.1	1.0

13: Sierra College Blvd & Stadium Dwy Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.2	0.2
Total Delay (hr)	2.4	2.2	2.2	2.4	2.1	2.2
Total Del/Veh (s)	4.0	3.8	3.6	4.0	3.6	3.8
Stop Del/Veh (s)	1.7	1.4	1.5	1.6	1.4	1.5

21: Sierra College Blvd & Dwy S of Brace Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.0	1.0	0.9	0.8	0.8	0.9
Total Del/Veh (s)	2.3	2.2	2.2	2.1	2.0	2.1
Stop Del/Veh (s)	0.3	0.3	0.3	0.2	0.2	0.3

99: I-80 WB On Ramp & Sierra College Blvd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.4	1.6	1.4	1.4	1.4	1.4
Total Del/Veh (s)	2.0	2.1	1.9	1.9	1.9	2.0
Stop Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1

101: Sierra College Blvd & I-80 EB On Ramp Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.0	1.0	1.1	1.1	1.1	1.1
Total Del/Veh (s)	1.5	1.4	1.6	1.5	1.6	1.5
Stop Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	1.7	1.7	1.6	1.7	1.7	1.7
Denied Del/Veh (s)	1.1	1.1	1.1	1.1	1.1	1.1
Total Delay (hr)	71.8	81.8	64.2	67.6	74.1	71.9
Total Del/Veh (s)	46.2	53.2	42.3	43.6	48.5	46.8
Stop Del/Veh (s)	27.9	34.0	25.7	26.8	30.6	29.0

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	1.7	1.7	1.6	1.7	1.7	1.7
Denied Del/Veh (s)	1.1	1.1	1.1	1.1	1.1	1.1
Total Delay (hr)	71.8	81.8	64.2	67.6	74.1	71.9
Total Del/Veh (s)	46.2	53.2	42.3	43.6	48.5	46.8
Stop Del/Veh (s)	27.9	34.0	25.7	26.8	30.6	29.0
Stop/Veh	1.40	1.48	1.35	1.34	1.42	1.39
Travel Dist (mi)	4852.9	4750.9	4589.6	4659.0	4709.7	4712.4
Travel Time (hr)	212.5	219.3	197.3	203.1	210.5	208.5
Avg Speed (mph)	23	22	23	23	23	23
Vehicles Entered	5393	5323	5281	5375	5302	5333
Vehicles Exited	5382	5311	5265	5352	5302	5325
Hourly Exit Rate	5382	5311	5265	5352	5302	5325
Input Volume	33580	33580	33580	33580	33580	33580
% of Volume	16	16	16	16	16	16
Denied Entry Before	4	1	1	4	0	0
Denied Entry After	0	1	2	2	1	0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	1.2	12.7	0.2	47	48	1.1
	80	0.6	12.0	0.2	46	47	0.6
	107	1.2	12.4	0.2	45	45	1.1
Bass Pro Dr/Domingue	12	2.0	4.2	0.0	28	28	2.1
Schriber Way	11	1.1	8.8	0.1	34	34	1.2
I-80 EB Ramps	10	11.4	17.5	0.1	16	17	10.6
I-80 EB On Ramp	101	2.9	12.8	0.1	33	33	2.9
I-80 WB On Ramp	99	0.4	10.7	0.1	40	39	0.4
I-80 WB Ramps	9	8.8	16.2	0.1	19	19	8.8
Granite Dr	8	11.5	19.4	0.1	17	16	12.3
Dwy S of Brace Rd	21	3.4	22.2	0.2	34	33	3.6
Brace Rd	7	7.4	12.5	0.1	17	16	8.0
Taylor Rd	6	18.7	29.4	0.1	15	15	19.3
Total		70.8	191.0	1.5	28	28	71.7

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	47	1.3	47	1.2	46	1.5	48
	46	0.7	46	0.7	46	0.7	47
	45	1.1	44	1.4	44	1.3	46
Bass Pro Dr/Domingue	31	1.7	27	2.3	28	2.1	29
Schriber Way	35	1.0	34	1.2	34	1.1	34
I-80 EB Ramps	16	11.3	16	11.1	15	11.7	15
I-80 EB On Ramp	33	2.9	33	2.8	32	2.9	33
I-80 WB On Ramp	40	0.4	40	0.4	39	0.4	40
I-80 WB Ramps	18	10.0	20	8.1	19	8.7	19
Granite Dr	18	10.3	18	10.8	16	12.4	17
Dwy S of Brace Rd	34	3.4	34	3.4	34	3.2	33
Brace Rd	18	6.5	16	7.8	18	6.6	16
Taylor Rd	15	19.4	16	17.2	16	17.7	15
Total	28	69.7	28	68.5	28	70.3	27

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	70.6	145.7	1.0	24	25	63.3
Brace Rd	7	7.7	19.3	0.1	23	23	8.5
Dwy S of Brace Rd	21	1.7	7.0	0.1	30	30	1.7
Granite Dr	8	16.9	35.2	0.2	21	21	17.1
I-80 WB Ramps	9	17.1	24.9	0.1	13	14	15.3
I-80 WB On Ramp	99	3.6	10.9	0.1	28	28	3.6
I-80 EB On Ramp	101	0.6	10.3	0.1	41	41	0.7
I-80 EB Ramps	10	9.1	20.2	0.1	21	20	9.6
Schriber Way	11	2.7	9.6	0.1	29	28	2.9
Bass Pro Dr/Domingue	12	2.5	9.9	0.1	31	31	2.4
	107	0.4	4.8	0.0	25	25	0.4
	80	0.9	13.9	0.2	40	40	0.9
Stadium Dwy	13	4.0	14.5	0.2	38	38	4.2
Total		137.9	326.1	2.3	25	26	130.6

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	19	105.8	28	51.1	27	55.1	23
Brace Rd	23	7.7	24	7.1	22	8.4	24
Dwy S of Brace Rd	29	1.8	29	1.8	29	1.7	31
Granite Dr	21	18.0	22	15.6	22	15.5	20
I-80 WB Ramps	11	21.0	13	16.8	15	14.3	13
I-80 WB On Ramp	27	3.7	29	3.5	29	3.4	28
I-80 EB On Ramp	41	0.6	41	0.7	41	0.6	41
I-80 EB Ramps	22	8.5	21	9.0	21	9.3	21
Schriber Way	29	2.6	29	2.6	29	2.7	29
Bass Pro Dr/Domingue	31	2.4	31	2.3	30	2.7	30
	25	0.4	26	0.4	25	0.5	25
	40	0.9	40	0.8	40	0.9	40
Stadium Dwy	38	3.9	38	4.0	38	4.2	39
Total	22	177.4	27	115.7	27	119.4	25

6: Sierra College Blvd & Taylor Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.7	0.7	0.7	0.8	0.7	0.7
Denied Del/Veh (s)	1.0	1.0	1.0	1.1	0.9	1.0
Total Delay (hr)	25.5	26.8	28.7	35.6	28.7	29.1
Total Del/Veh (s)	34.2	36.1	37.6	45.2	38.0	38.3
Stop Del/Veh (s)	26.2	27.7	28.7	35.5	29.2	29.5

7: Sierra College Blvd & Brace Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.2	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.2	0.3	0.2	0.2	0.2	0.2
Total Delay (hr)	5.5	6.7	7.1	11.2	8.5	7.8
Total Del/Veh (s)	9.1	10.9	11.2	17.5	13.6	12.5
Stop Del/Veh (s)	5.4	6.7	7.2	12.5	9.0	8.2

8: Sierra College Blvd & Granite Dr Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.3	0.3	0.2	0.2	0.2	0.3
Denied Del/Veh (s)	0.3	0.3	0.3	0.3	0.3	0.3
Total Delay (hr)	15.9	15.7	15.9	16.2	15.0	15.7
Total Del/Veh (s)	19.9	19.7	19.8	20.0	19.2	19.7
Stop Del/Veh (s)	14.7	14.4	14.5	14.6	13.7	14.4

9: Sierra College Blvd & I-80 WB Ramps Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.5	0.5	1.0	0.6	0.4	0.6
Denied Del/Veh (s)	0.5	0.5	1.0	0.6	0.4	0.6
Total Delay (hr)	20.7	22.6	21.3	23.7	20.2	21.7
Total Del/Veh (s)	20.2	21.8	20.6	22.3	19.7	20.9
Stop Del/Veh (s)	15.1	16.6	15.5	17.1	14.8	15.8

10: Sierra College Blvd & I-80 EB Ramps Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.4	0.5	0.5	0.5	0.5	0.5
Denied Del/Veh (s)	0.4	0.4	0.4	0.5	0.4	0.4
Total Delay (hr)	16.0	15.9	15.6	16.5	16.5	16.1
Total Del/Veh (s)	14.9	14.8	14.4	14.9	15.2	14.8
Stop Del/Veh (s)	10.7	10.7	10.3	10.7	11.1	10.7

11: Sierra College Blvd & Schriber Way Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.4	1.2	1.4	1.4	1.4	1.4
Total Del/Veh (s)	2.1	1.9	2.1	2.2	2.1	2.1
Stop Del/Veh (s)	0.4	0.3	0.5	0.4	0.4	0.4

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.1	0.2	0.1	0.2	0.2	0.2
Total Delay (hr)	2.4	2.4	2.1	2.5	2.5	2.4
Total Del/Veh (s)	3.6	3.7	3.1	3.7	3.7	3.6
Stop Del/Veh (s)	1.9	1.8	1.5	1.9	1.9	1.8

13: Sierra College Blvd & Stadium Dwy Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.2	0.3	0.3	0.3	0.3	0.3
Denied Del/Veh (s)	0.3	0.4	0.4	0.4	0.4	0.4
Total Delay (hr)	3.3	3.7	3.6	4.0	4.0	3.7
Total Del/Veh (s)	5.1	5.6	5.5	5.9	6.0	5.6
Stop Del/Veh (s)	2.1	2.2	2.3	2.4	2.8	2.4

21: Sierra College Blvd & Dwy S of Brace Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	2.0	1.9	8.0	3.0	3.3
Total Del/Veh (s)	3.1	3.5	3.2	13.4	5.3	5.7
Stop Del/Veh (s)	0.2	0.3	0.3	8.8	1.4	2.3

99: I-80 WB On Ramp & Sierra College Blvd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.9	1.9	1.8	2.0	1.7	1.8
Total Del/Veh (s)	2.6	2.6	2.5	2.6	2.4	2.5
Stop Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1

101: Sierra College Blvd & I-80 EB On Ramp Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.8	1.7	1.8	1.8	1.8	1.8
Total Del/Veh (s)	1.9	1.9	1.9	1.9	2.0	1.9
Stop Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.4	2.5	2.9	2.7	2.4	2.6
Denied Del/Veh (s)	1.2	1.3	1.5	1.3	1.2	1.3
Total Delay (hr)	103.8	108.3	108.6	130.9	111.2	112.6
Total Del/Veh (s)	50.8	52.9	52.9	62.4	54.0	54.7
Stop Del/Veh (s)	31.9	33.4	33.5	41.3	34.1	34.9

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.4	2.5	2.9	2.7	2.4	2.6
Denied Del/Veh (s)	1.2	1.3	1.5	1.3	1.2	1.3
Total Delay (hr)	103.8	108.3	108.6	130.9	111.2	112.6
Total Del/Veh (s)	50.8	52.9	52.9	62.4	54.0	54.7
Stop Del/Veh (s)	31.9	33.4	33.5	41.3	34.1	34.9
Stop/Veh	1.40	1.43	1.41	1.55	1.45	1.45
Travel Dist (mi)	5709.8	5723.3	5793.0	5905.4	5762.5	5778.8
Travel Time (hr)	273.2	278.8	280.8	306.8	282.5	284.4
Avg Speed (mph)	21	21	21	19	21	21
Vehicles Entered	7064	7109	7101	7257	7129	7131
Vehicles Exited	7075	7111	7086	7214	7143	7125
Hourly Exit Rate	7075	7111	7086	7214	7143	7125
Input Volume	41212	41212	41212	41212	41212	41212
% of Volume	17	17	17	18	17	17
Denied Entry Before	2	0	3	4	3	1
Denied Entry After	4	1	1	4	1	0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	4.7	16.3	0.2	37	38	4.2
	80	2.3	13.7	0.2	41	41	2.1
	107	2.6	13.8	0.2	40	40	2.6
Bass Pro Dr/Domingue	12	2.7	4.9	0.0	24	24	2.8
Schriber Way	11	1.7	9.5	0.1	32	31	1.8
I-80 EB Ramps	10	17.8	24.0	0.1	11	11	18.0
I-80 EB On Ramp	101	3.5	12.5	0.1	34	34	3.6
I-80 WB On Ramp	99	0.7	10.9	0.1	39	39	0.7
I-80 WB Ramps	9	11.6	18.4	0.1	17	18	11.0
Granite Dr	8	14.9	23.0	0.1	14	14	15.4
Dwy S of Brace Rd	21	10.3	29.0	0.2	26	31	5.4
Brace Rd	7	15.2	20.4	0.1	10	15	9.1
Taylor Rd	6	50.0	60.8	0.1	7	8	42.5
Total		138.2	257.2	1.5	21	22	119.1

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	35	5.3	37	4.7	36	5.1	37
	40	2.5	41	2.2	40	2.6	41
	41	2.5	42	2.2	40	2.8	40
Bass Pro Dr/Domingue	25	2.6	27	2.2	22	3.2	24
Schriber Way	32	1.6	33	1.5	31	1.9	31
I-80 EB Ramps	12	17.6	12	17.2	12	17.1	11
I-80 EB On Ramp	34	3.5	34	3.4	34	3.5	34
I-80 WB On Ramp	39	0.6	38	0.7	39	0.6	39
I-80 WB Ramps	18	11.1	17	11.9	17	12.0	17
Granite Dr	14	15.2	14	14.9	15	14.0	14
Dwy S of Brace Rd	30	6.0	31	5.3	17	25.2	27
Brace Rd	12	12.4	13	11.5	7	25.9	10
Taylor Rd	9	41.4	8	46.2	6	68.1	7
Total	22	122.3	22	123.8	18	182.0	20

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	40.3	114.8	1.0	30	32	33.6
Brace Rd	7	7.6	19.1	0.1	24	24	7.4
Dwy S of Brace Rd	21	1.7	7.0	0.1	30	31	1.5
Granite Dr	8	19.6	38.0	0.2	20	19	20.2
I-80 WB Ramps	9	27.9	35.9	0.1	9	10	26.3
I-80 WB On Ramp	99	4.6	12.5	0.1	24	24	4.7
I-80 EB On Ramp	101	0.8	10.4	0.1	41	41	0.7
I-80 EB Ramps	10	9.3	20.3	0.1	21	21	9.4
Schriber Way	11	2.3	9.4	0.1	29	29	2.4
Bass Pro Dr/Domingue	12	3.0	10.4	0.1	29	29	3.1
	107	0.9	4.1	0.0	29	30	0.9
	80	1.0	12.5	0.2	45	45	1.0
Stadium Dwy	13	4.7	15.4	0.2	36	37	4.4
Total		123.9	309.8	2.3	26	27	115.5

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	30	40.2	29	45.2	30	44.1	31
Brace Rd	23	8.0	24	7.7	24	7.4	23
Dwy S of Brace Rd	29	1.8	30	1.7	29	1.8	30
Granite Dr	20	19.5	20	19.4	19	20.2	20
I-80 WB Ramps	9	30.2	10	24.7	9	29.6	9
I-80 WB On Ramp	24	4.6	25	4.3	24	4.7	25
I-80 EB On Ramp	40	0.8	41	0.8	40	0.9	41
I-80 EB Ramps	21	9.3	21	9.1	21	9.5	21
Schriber Way	30	2.2	29	2.3	29	2.4	29
Bass Pro Dr/Domingue	28	3.3	30	2.7	30	2.7	28
	29	1.0	30	0.9	30	0.9	29
	45	1.1	44	1.1	45	1.0	44
Stadium Dwy	37	4.5	36	4.6	36	4.9	35
Total	26	126.4	26	124.5	26	130.1	26

6: Sierra College Blvd & Taylor Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.6	0.6	0.5	0.6	0.5	0.6
Denied Del/Veh (s)	1.1	1.0	1.0	1.1	1.1	1.1
Total Delay (hr)	12.8	14.1	12.8	13.2	12.1	13.0
Total Del/Veh (s)	23.6	26.2	24.6	24.7	23.8	24.6
Stop Del/Veh (s)	18.2	20.7	19.2	19.5	18.6	19.3

7: Sierra College Blvd & Brace Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.3	0.3	0.3	0.3	0.3	0.3
Total Delay (hr)	3.7	3.8	3.3	3.4	3.7	3.6
Total Del/Veh (s)	8.2	8.4	7.6	7.6	8.3	8.0
Stop Del/Veh (s)	4.9	5.3	4.5	4.4	5.0	4.8

8: Sierra College Blvd & Granite Dr Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.2	0.2	0.2	0.2	0.2	0.2
Denied Del/Veh (s)	0.3	0.3	0.3	0.3	0.4	0.3
Total Delay (hr)	8.2	8.3	8.1	8.4	8.5	8.3
Total Del/Veh (s)	14.1	14.5	14.5	14.3	14.7	14.4
Stop Del/Veh (s)	10.4	10.5	10.6	10.5	10.7	10.6

9: Sierra College Blvd & I-80 WB Ramps Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.7	0.4	0.4	0.4	0.4	0.4
Denied Del/Veh (s)	0.7	0.5	0.4	0.5	0.4	0.5
Total Delay (hr)	18.8	20.3	17.5	18.2	17.7	18.5
Total Del/Veh (s)	21.0	22.5	20.1	20.4	19.9	20.8
Stop Del/Veh (s)	16.5	18.0	15.9	15.9	15.7	16.4

10: Sierra College Blvd & I-80 EB Ramps Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.4	0.4	0.4	0.4	0.4	0.4
Denied Del/Veh (s)	0.5	0.5	0.5	0.4	0.5	0.5
Total Delay (hr)	13.1	13.1	13.1	13.8	12.5	13.1
Total Del/Veh (s)	14.1	14.4	14.4	14.9	13.9	14.3
Stop Del/Veh (s)	10.9	11.2	11.1	11.5	10.7	11.1

11: Sierra College Blvd & Schriber Way Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.8	0.7	0.8	0.7	0.7	0.7
Total Del/Veh (s)	1.9	1.8	1.9	1.8	1.7	1.8
Stop Del/Veh (s)	0.5	0.5	0.5	0.5	0.4	0.5

12: Sierra College Blvd & Bass Pro Dr/Dominguez Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.2	0.3	0.3	0.2	0.2	0.2
Total Delay (hr)	1.3	1.4	1.5	1.2	1.3	1.4
Total Del/Veh (s)	3.1	3.4	3.6	2.9	3.2	3.3
Stop Del/Veh (s)	1.7	1.9	2.0	1.4	1.8	1.8

13: Sierra College Blvd & Stadium Dwy Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Denied Del/Veh (s)	0.2	0.2	0.3	0.2	0.3	0.2
Total Delay (hr)	1.0	0.7	1.0	1.0	0.9	0.9
Total Del/Veh (s)	2.5	1.7	2.3	2.4	2.3	2.2
Stop Del/Veh (s)	0.8	0.5	0.8	0.7	0.8	0.7

21: Sierra College Blvd & Dwy S of Brace Rd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.8	0.8	0.8	0.8	0.8	0.8
Total Del/Veh (s)	1.9	2.0	2.1	2.0	2.1	2.0
Stop Del/Veh (s)	0.2	0.2	0.2	0.2	0.2	0.2

99: I-80 WB On Ramp & Sierra College Blvd Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.5	1.5	1.4	1.6	1.4	1.5
Total Del/Veh (s)	2.1	2.1	2.0	2.2	2.0	2.1
Stop Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.1

101: Sierra College Blvd & I-80 EB On Ramp Performance by run number

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.2	1.1	1.1	1.2	1.1	1.1
Total Del/Veh (s)	1.5	1.4	1.4	1.5	1.5	1.5
Stop Del/Veh (s)	0.1	0.1	0.1	0.1	0.2	0.1

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.2	1.9	1.9	1.9	1.9	2.0
Denied Del/Veh (s)	1.3	1.2	1.2	1.2	1.2	1.2
Total Delay (hr)	66.9	69.4	65.1	67.2	64.3	66.6
Total Del/Veh (s)	39.6	41.5	39.6	40.1	39.1	40.0
Stop Del/Veh (s)	26.6	28.5	26.6	26.9	26.3	27.0

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.2	1.9	1.9	1.9	1.9	2.0
Denied Del/Veh (s)	1.3	1.2	1.2	1.2	1.2	1.2
Total Delay (hr)	66.9	69.4	65.1	67.2	64.3	66.6
Total Del/Veh (s)	39.6	41.5	39.6	40.1	39.1	40.0
Stop Del/Veh (s)	26.6	28.5	26.6	26.9	26.3	27.0
Stop/Veh	1.29	1.32	1.32	1.30	1.31	1.31
Travel Dist (mi)	4348.9	4259.6	4226.6	4267.7	4181.6	4256.9
Travel Time (hr)	199.9	199.9	194.4	197.9	192.4	196.9
Avg Speed (mph)	22	22	22	22	22	22
Vehicles Entered	5876	5821	5744	5827	5702	5795
Vehicles Exited	5869	5846	5730	5835	5711	5797
Hourly Exit Rate	5869	5846	5730	5835	5711	5797
Input Volume	31639	31639	31639	31639	31639	31639
% of Volume	19	18	18	18	18	18
Denied Entry Before	1	3	0	1	2	0
Denied Entry After	4	3	1	1	2	0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	2.0	13.5	0.2	44	43	2.4
	80	1.0	12.4	0.2	45	44	1.3
	107	1.7	12.9	0.2	43	43	1.9
Bass Pro Dr/Domingue	12	2.6	4.9	0.0	25	25	2.6
Schriber Way	11	1.5	9.2	0.1	33	32	1.7
I-80 EB Ramps	10	19.7	25.8	0.1	11	11	19.0
I-80 EB On Ramp	101	3.6	13.7	0.1	31	31	3.5
I-80 WB On Ramp	99	0.5	10.8	0.1	39	39	0.6
I-80 WB Ramps	9	9.9	17.0	0.1	19	17	11.3
Granite Dr	8	11.6	19.7	0.1	17	18	10.6
Dwy S of Brace Rd	21	3.2	21.1	0.2	35	36	3.0
Brace Rd	7	6.7	11.8	0.1	18	18	6.5
Taylor Rd	6	21.9	32.7	0.1	14	14	21.4
Total		85.8	205.4	1.5	26	26	85.7

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	46	1.6	45	1.8	44	2.1	45
	46	0.9	45	1.0	45	1.1	45
	43	1.8	43	1.7	43	1.7	43
Bass Pro Dr/Domingue	23	2.9	24	2.8	28	2.0	25
Schriber Way	33	1.4	33	1.5	34	1.3	33
I-80 EB Ramps	10	20.8	11	19.0	10	20.7	11
I-80 EB On Ramp	31	3.7	31	3.6	31	3.8	31
I-80 WB On Ramp	39	0.6	40	0.5	39	0.6	40
I-80 WB Ramps	17	11.3	19	9.6	20	9.0	21
Granite Dr	17	11.5	16	13.0	17	10.8	16
Dwy S of Brace Rd	36	3.1	35	3.4	35	3.3	36
Brace Rd	16	7.6	19	6.1	19	6.1	17
Taylor Rd	13	23.1	14	22.5	14	22.0	15
Total	25	90.2	26	86.3	26	84.4	26

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	28.8	104.1	1.0	33	33	29.6
Brace Rd	7	7.5	19.1	0.1	24	23	8.0
Dwy S of Brace Rd	21	1.5	6.8	0.1	31	31	1.4
Granite Dr	8	14.4	32.9	0.2	23	23	13.2
I-80 WB Ramps	9	29.1	37.2	0.1	9	9	27.7
I-80 WB On Ramp	99	4.1	11.6	0.1	27	27	3.9
I-80 EB On Ramp	101	0.6	10.3	0.1	41	41	0.7
I-80 EB Ramps	10	6.3	16.1	0.1	26	27	5.8
Schriber Way	11	1.9	9.0	0.1	31	31	1.8
Bass Pro Dr/Domingue	12	2.4	9.8	0.1	31	33	1.9
	107	0.8	3.9	0.0	31	32	0.7
	80	0.7	12.2	0.2	46	46	0.7
Stadium Dwy	13	2.0	13.0	0.2	43	43	2.1
Total		100.1	286.0	2.3	29	29	97.5

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	32	31.9	33	28.2	33	27.9	34
Brace Rd	24	7.4	24	7.1	24	7.4	24
Dwy S of Brace Rd	31	1.3	31	1.3	31	1.4	30
Granite Dr	22	15.7	22	14.8	23	13.7	23
I-80 WB Ramps	8	33.2	9	30.3	9	26.7	9
I-80 WB On Ramp	26	4.2	26	4.1	27	4.1	27
I-80 EB On Ramp	41	0.6	41	0.6	41	0.6	41
I-80 EB Ramps	27	5.8	24	7.6	26	6.4	27
Schriber Way	31	1.9	30	2.2	31	2.0	31
Bass Pro Dr/Domingue	31	2.3	29	2.8	30	2.6	31
	31	0.8	30	0.8	30	0.9	31
	46	0.6	45	0.8	45	0.8	46
Stadium Dwy	45	1.4	41	2.3	42	2.3	42
Total	28	107.2	28	103.1	29	96.7	29

Intersection: 6: Sierra College Blvd & Taylor Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	L	T	R	L	T	R	L	T
Maximum Queue (ft)	134	196	147	122	171	200	72	216	256	100	104	274
Average Queue (ft)	38	96	45	44	76	92	16	78	105	24	22	131
95th Queue (ft)	87	160	91	92	133	176	59	160	198	67	65	222
Link Distance (ft)		689				943			547	547		4997
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	120		120	150	150		150	190			215	
Storage Blk Time (%)		4	0		0	1		0	1			1
Queuing Penalty (veh)		8	1		1	4		0	2			1

Intersection: 6: Sierra College Blvd & Taylor Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	78
Average Queue (ft)	14
95th Queue (ft)	60
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	215
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 7: Sierra College Blvd & Brace Rd

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	R	L	R	T	TR	L	T	TR
Maximum Queue (ft)	66	104	90	184	139	100	116	117
Average Queue (ft)	34	51	30	76	56	42	36	53
95th Queue (ft)	59	86	66	149	116	78	87	107
Link Distance (ft)	572		487	242	242		547	547
Upstream Blk Time (%)				0				
Queuing Penalty (veh)				0				
Storage Bay Dist (ft)		85				155		
Storage Blk Time (%)		1	0			0	0	
Queuing Penalty (veh)		1	0			0	0	

Intersection: 8: Sierra College Blvd & Granite Dr

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	R	L	T	R	L	T	T	R	L
Maximum Queue (ft)	151	70	92	65	122	66	36	188	222	116	40	96
Average Queue (ft)	66	17	49	29	54	19	12	80	60	45	10	43
95th Queue (ft)	118	50	79	53	99	50	31	148	138	101	28	82
Link Distance (ft)		730	730		474	474	474		375	375	375	
Upstream Blk Time (%)									0			
Queuing Penalty (veh)									0			
Storage Bay Dist (ft)	185			185				170				280
Storage Blk Time (%)	0							1	0			
Queuing Penalty (veh)	0							2	0			

Intersection: 8: Sierra College Blvd & Granite Dr

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	165	206	102
Average Queue (ft)	77	103	31
95th Queue (ft)	132	175	78
Link Distance (ft)	1019	1019	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			190
Storage Blk Time (%)		1	
Queuing Penalty (veh)		1	

Intersection: 9: Sierra College Blvd & I-80 WB Ramps

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	L	R	L	L	TR	R	L	T	T	T	R	T
Maximum Queue (ft)	109	159	176	210	284	114	180	318	160	65	85	278
Average Queue (ft)	46	70	74	130	148	12	145	128	51	20	39	153
95th Queue (ft)	88	125	147	202	249	58	203	274	124	52	71	236
Link Distance (ft)	617	617		586	586			391	391	391		375
Upstream Blk Time (%)								0				
Queuing Penalty (veh)								0				
Storage Bay Dist (ft)			220			180	130				295	
Storage Blk Time (%)				0	5		17	1				
Queuing Penalty (veh)				0	4		33	3				

Intersection: 9: Sierra College Blvd & I-80 WB Ramps

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	258	236	174
Average Queue (ft)	149	94	32
95th Queue (ft)	228	185	94
Link Distance (ft)	375	375	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			130
Storage Blk Time (%)		5	
Queuing Penalty (veh)		4	

Existing Plus Project Conditions

Project Driveway Option A

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.0	2.0	1.9	2.0	2.0	2.0
Denied Del/Veh (s)	1.3	1.2	1.2	1.2	1.3	1.2
Total Delay (hr)	78.1	72.3	70.8	73.6	72.7	73.5
Total Del/Veh (s)	47.4	43.7	43.7	44.6	44.3	44.7
Stop Delay (hr)	52.6	48.2	46.8	49.2	48.0	49.0
Stop Del/Veh (s)	31.9	29.2	28.8	29.8	29.3	29.8
Stop/Veh	1.56	1.49	1.49	1.50	1.55	1.52
Travel Dist (mi)	4921.6	4887.1	4884.7	4948.2	4936.1	4915.6
Travel Time (hr)	256.1	248.7	246.4	251.9	250.7	250.8
Avg Speed (mph)	19	20	20	20	20	20
Vehicles Entered	5740	5735	5630	5760	5704	5707
Vehicles Exited	5701	5707	5584	5665	5641	5661
Hourly Exit Rate	5701	5707	5584	5665	5641	5661
Input Volume	37805	37805	37805	37805	37805	37805
% of Volume	15	15	15	15	15	15
Denied Entry Before	3	0	2	4	0	0
Denied Entry After	4	1	2	2	5	0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	1.0	19.9	0.2	30	30	0.7
	80	0.7	19.6	0.2	28	29	0.5
	107	0.6	17.0	0.1	29	29	0.6
Bass Pro Dr/Domingue	12	2.9	8.9	0.1	21	21	3.1
Schriber Way	11	0.9	11.3	0.1	27	27	1.0
I-80 EB Ramps	10	11.8	19.9	0.1	14	14	12.3
I-80 EB On Ramp	101	2.1	15.2	0.1	28	28	2.0
I-80 WB On Ramp	99	0.4	14.1	0.1	30	30	0.5
I-80 WB Ramps	9	8.2	17.9	0.1	17	17	7.9
Granite Dr	8	12.5	23.1	0.1	14	13	14.3
Project Driveway	24	7.2	21.7	0.1	21	21	7.8
Dwy S of Brace Rd	21	1.4	10.9	0.1	27	27	1.4
Brace Rd	7	7.3	13.9	0.1	15	16	6.5
Taylor Rd	6	16.7	30.8	0.1	15	15	15.7
Total		73.8	244.3	1.5	22	22	74.3

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	30	1.0	30	1.0	30	0.9	29
	28	0.7	28	0.7	28	0.8	28
	28	0.7	29	0.6	29	0.6	29
Bass Pro Dr/Domingue	22	2.5	22	2.7	23	2.2	19
Schriber Way	27	0.9	27	0.9	27	0.8	26
I-80 EB Ramps	15	10.4	14	11.2	13	12.2	13
I-80 EB On Ramp	28	2.1	28	2.0	27	2.2	28
I-80 WB On Ramp	30	0.5	30	0.4	30	0.4	30
I-80 WB Ramps	17	8.3	17	8.6	17	7.9	17
Granite Dr	14	12.4	15	11.9	15	11.3	14
Project Driveway	22	6.3	22	6.4	21	7.7	21
Dwy S of Brace Rd	27	1.3	27	1.2	26	1.6	26
Brace Rd	15	7.0	17	5.8	13	8.5	13
Taylor Rd	17	12.3	13	19.3	14	17.7	14
Total	22	66.3	22	72.6	21	74.8	21

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	65.8	176.3	1.0	20	17	91.1
Brace Rd	7	6.3	21.8	0.1	21	22	5.4
Dwy S of Brace Rd	21	1.3	8.2	0.1	25	25	1.1
Project Driveway	24	5.1	14.4	0.1	20	19	5.7
Granite Dr	8	18.2	33.3	0.1	14	14	17.0
I-80 WB Ramps	9	14.4	24.7	0.1	13	13	14.4
I-80 WB On Ramp	99	2.6	12.5	0.1	25	24	2.7
I-80 EB On Ramp	101	0.7	13.6	0.1	31	31	0.7
I-80 EB Ramps	10	9.0	23.7	0.1	18	18	9.3
Schriber Way	11	1.9	11.1	0.1	25	24	2.0
Bass Pro Dr/Domingue	12	2.6	12.5	0.1	24	24	2.7
	107	0.9	7.5	0.1	25	25	0.9
	80	1.1	17.5	0.1	28	28	1.3
Stadium Dwy	13	3.9	21.4	0.2	26	26	4.2
Total		133.9	398.6	2.3	20	19	158.6

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	20	60.2	21	54.0	19	69.6	21
Brace Rd	20	7.2	21	6.6	21	6.6	21
Dwy S of Brace Rd	25	1.3	25	1.3	24	1.4	25
Project Driveway	20	5.2	21	4.4	20	5.1	20
Granite Dr	13	20.5	13	19.5	15	16.2	14
I-80 WB Ramps	12	16.4	14	13.3	14	13.0	13
I-80 WB On Ramp	25	2.7	25	2.6	25	2.6	25
I-80 EB On Ramp	31	0.8	31	0.7	31	0.7	31
I-80 EB Ramps	18	9.0	18	9.1	18	8.5	18
Schriber Way	25	1.9	25	1.9	25	1.8	25
Bass Pro Dr/Domingue	24	2.9	24	2.6	25	2.0	24
	25	1.0	25	0.8	26	0.7	25
	28	1.0	28	1.1	28	1.1	28
Stadium Dwy	27	3.5	26	4.2	26	3.6	26
Total	20	133.5	21	122.0	21	132.9	21

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	3.1	3.0	3.1	8.9	9.3	5.5
Denied Del/Veh (s)	1.5	1.5	1.5	4.2	4.4	2.6
Total Delay (hr)	186.5	150.9	174.4	259.5	236.9	201.6
Total Del/Veh (s)	87.3	71.4	80.0	120.3	108.1	93.6
Stop Delay (hr)	139.8	107.2	128.2	208.0	187.7	154.2
Stop Del/Veh (s)	65.5	50.7	58.8	96.4	85.6	71.6
Stop/Veh	2.02	1.87	2.03	2.27	2.12	2.07
Travel Dist (mi)	6469.0	6421.5	6657.4	6498.1	6547.1	6518.6
Travel Time (hr)	422.2	384.6	415.8	501.5	481.4	441.1
Avg Speed (mph)	15	17	16	13	14	15
Vehicles Entered	7396	7347	7579	7472	7594	7479
Vehicles Exited	7242	7208	7444	7082	7304	7255
Hourly Exit Rate	7242	7208	7444	7082	7304	7255
Input Volume	49939	49939	49939	49939	49939	49939
% of Volume	15	14	15	14	15	15
Denied Entry Before	5	5	1	4	3	2
Denied Entry After	4	2	6	30	18	10

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	4.3	23.3	0.2	25	25	4.7
	80	2.1	21.0	0.2	26	26	2.2
	107	1.4	17.9	0.1	27	27	1.6
Bass Pro Dr/Domingue	12	3.6	9.6	0.1	20	19	4.0
Schriber Way	11	1.3	11.7	0.1	26	25	1.4
I-80 EB Ramps	10	19.3	27.7	0.1	10	10	20.4
I-80 EB On Ramp	101	3.3	18.2	0.1	23	23	3.4
I-80 WB On Ramp	99	2.1	15.8	0.1	27	28	1.5
I-80 WB Ramps	9	24.3	34.6	0.1	9	9	24.6
Granite Dr	8	28.4	39.1	0.1	8	8	28.9
Project Driveway	24	23.7	39.0	0.1	12	13	19.2
Dwy S of Brace Rd	21	11.9	22.0	0.1	13	20	4.3
Brace Rd	7	17.3	24.0	0.1	8	11	12.0
Taylor Rd	6	47.7	62.2	0.1	7	8	39.2
Total		190.7	366.1	1.5	14	15	167.3

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	26	3.9	26	4.3	26	4.2	25
	27	1.9	27	2.0	26	2.2	26
	28	1.3	28	1.4	27	1.4	27
Bass Pro Dr/Domingue	21	3.3	20	3.6	20	3.4	20
Schriber Way	26	1.3	26	1.2	26	1.3	26
I-80 EB Ramps	10	18.3	10	20.2	10	20.2	11
I-80 EB On Ramp	23	3.3	23	3.3	23	3.5	23
I-80 WB On Ramp	29	1.1	29	1.2	22	5.4	28
I-80 WB Ramps	11	17.2	11	16.8	6	44.5	11
Granite Dr	10	22.8	10	20.9	6	41.5	9
Project Driveway	12	22.2	8	39.5	14	18.6	14
Dwy S of Brace Rd	20	4.5	6	35.3	15	9.2	19
Brace Rd	11	11.3	5	31.3	8	18.5	10
Taylor Rd	8	38.8	6	63.7	7	52.7	8
Total	16	151.1	13	244.7	13	226.6	16

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	49.5	160.1	1.0	22	23	41.2
Brace Rd	7	21.8	37.2	0.1	12	20	7.6
Dwy S of Brace Rd	21	12.1	19.0	0.1	11	12	10.2
Project Driveway	24	37.2	46.7	0.1	6	6	38.3
Granite Dr	8	65.3	80.3	0.1	6	6	64.9
I-80 WB Ramps	9	46.9	57.9	0.1	6	6	48.9
I-80 WB On Ramp	99	4.1	14.6	0.1	21	21	3.8
I-80 EB On Ramp	101	1.2	14.1	0.1	30	30	1.3
I-80 EB Ramps	10	10.0	24.9	0.1	17	17	10.1
Schriber Way	11	1.7	11.1	0.1	25	25	1.8
Bass Pro Dr/Domingue	12	3.3	13.1	0.1	23	23	3.6
	107	0.9	7.7	0.1	25	25	0.9
	80	1.0	17.3	0.1	28	28	0.9
Stadium Dwy	13	4.2	22.1	0.2	25	25	4.0
Total		259.2	526.0	2.3	16	16	237.5

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	23	38.6	23	40.9	23	39.4	18
Brace Rd	23	4.8	20	7.1	9	34.5	7
Dwy S of Brace Rd	25	1.2	25	1.3	7	21.1	6
Project Driveway	16	8.7	17	7.8	3	76.0	4
Granite Dr	9	33.8	9	35.3	4	102.8	4
I-80 WB Ramps	5	50.3	7	39.3	5	53.8	6
I-80 WB On Ramp	21	4.3	21	4.2	21	4.3	22
I-80 EB On Ramp	30	1.3	30	1.2	30	1.1	30
I-80 EB Ramps	17	9.7	17	10.4	17	9.7	17
Schriber Way	24	1.9	25	1.7	25	1.6	25
Bass Pro Dr/Domingue	23	3.4	23	3.4	23	3.1	23
	25	1.0	25	1.0	25	0.9	25
	28	1.0	28	0.9	28	1.0	28
Stadium Dwy	25	4.2	25	4.1	25	4.3	25
Total	19	164.2	19	158.5	13	353.5	13

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.8	2.8	2.8	2.8	2.7	2.8
Denied Del/Veh (s)	1.5	1.5	1.5	1.5	1.4	1.5
Total Delay (hr)	115.7	116.6	121.9	111.4	102.8	113.7
Total Del/Veh (s)	59.5	60.1	63.1	57.6	53.9	58.9
Stop Delay (hr)	86.2	87.1	91.4	82.5	75.1	84.5
Stop Del/Veh (s)	44.3	44.9	47.3	42.7	39.4	43.8
Stop/Veh	1.67	1.67	1.73	1.66	1.64	1.68
Travel Dist (mi)	5215.0	5225.1	5202.7	5226.6	5119.9	5197.9
Travel Time (hr)	308.2	309.7	313.8	304.5	291.7	305.6
Avg Speed (mph)	17	17	17	17	18	17
Vehicles Entered	6770	6761	6723	6728	6624	6722
Vehicles Exited	6725	6644	6664	6655	6579	6652
Hourly Exit Rate	6725	6644	6664	6655	6579	6652
Input Volume	40602	40602	40602	40602	40602	40602
% of Volume	17	16	16	16	16	16
Denied Entry Before	0	1	2	3	2	1
Denied Entry After	2	3	1	3	0	0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	2.2	21.1	0.2	28	28	2.4
	80	1.2	20.1	0.2	28	28	1.2
	107	0.9	17.3	0.1	28	28	0.8
Bass Pro Dr/Domingue	12	3.4	9.4	0.1	20	20	3.5
Schriber Way	11	1.1	11.5	0.1	26	26	1.2
I-80 EB Ramps	10	19.7	27.9	0.1	10	10	18.5
I-80 EB On Ramp	101	2.7	17.0	0.1	25	25	2.7
I-80 WB On Ramp	99	0.7	14.4	0.1	29	30	0.6
I-80 WB Ramps	9	15.6	25.9	0.1	12	12	16.3
Granite Dr	8	16.2	27.0	0.1	12	12	17.1
Project Driveway	24	17.3	32.3	0.1	14	13	19.3
Dwy S of Brace Rd	21	2.7	12.7	0.1	23	22	3.1
Brace Rd	7	7.1	13.8	0.1	15	14	8.2
Taylor Rd	6	23.3	37.7	0.1	12	12	24.1
Total		114.2	288.1	1.5	18	18	119.0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	28	1.9	28	1.9	28	2.3	28
	28	1.1	28	1.2	27	1.3	28
	28	0.9	28	0.9	28	0.9	29
Bass Pro Dr/Domingue	20	3.3	20	3.4	20	3.3	20
Schriber Way	26	1.1	26	1.1	26	1.1	26
I-80 EB Ramps	10	20.6	10	20.1	10	19.1	10
I-80 EB On Ramp	25	2.7	25	2.8	25	2.6	25
I-80 WB On Ramp	29	1.0	29	0.7	30	0.6	29
I-80 WB Ramps	12	15.4	12	16.0	11	16.8	13
Granite Dr	13	14.3	10	21.0	13	14.6	13
Project Driveway	14	18.1	15	16.9	15	16.9	15
Dwy S of Brace Rd	23	2.7	23	2.7	23	2.7	23
Brace Rd	16	6.3	15	7.1	15	6.6	14
Taylor Rd	12	23.9	12	24.4	12	23.9	13
Total	18	113.3	18	120.1	18	112.8	19

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	34.2	144.9	1.0	24	24	33.9
Brace Rd	7	5.3	20.8	0.1	22	22	4.8
Dwy S of Brace Rd	21	1.1	7.9	0.1	26	26	1.0
Project Driveway	24	7.4	16.9	0.1	17	18	6.9
Granite Dr	8	21.6	36.8	0.1	13	14	17.8
I-80 WB Ramps	9	46.6	57.5	0.1	6	5	50.8
I-80 WB On Ramp	99	3.8	14.4	0.1	21	21	3.7
I-80 EB On Ramp	101	1.0	13.8	0.1	31	31	1.0
I-80 EB Ramps	10	9.1	23.8	0.1	18	18	8.7
Schriber Way	11	1.5	10.9	0.1	25	25	1.6
Bass Pro Dr/Domingue	12	2.6	12.5	0.1	24	25	2.4
	107	0.8	7.3	0.1	25	26	0.7
	80	0.8	17.3	0.1	28	28	0.9
Stadium Dwy	13	2.4	20.7	0.2	27	26	2.8
Total		138.1	405.6	2.3	20	20	137.0

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	24	32.6	24	36.6	24	33.6	24
Brace Rd	22	5.4	21	6.3	22	4.7	22
Dwy S of Brace Rd	26	1.1	25	1.2	26	1.0	26
Project Driveway	17	7.3	16	8.3	18	7.0	17
Granite Dr	13	20.0	10	30.3	13	20.8	14
I-80 WB Ramps	6	49.1	6	42.7	5	50.8	7
I-80 WB On Ramp	22	3.6	21	4.2	21	4.0	22
I-80 EB On Ramp	30	1.0	31	1.0	31	0.9	31
I-80 EB Ramps	16	11.5	18	8.9	19	7.9	18
Schriber Way	25	1.7	25	1.5	25	1.4	26
Bass Pro Dr/Domingue	24	2.7	24	2.6	24	2.5	24
	25	0.8	25	0.7	26	0.7	25
	28	0.8	29	0.7	29	0.7	28
Stadium Dwy	27	2.0	27	2.1	27	2.6	27
Total	20	139.6	20	147.2	20	138.7	21

Project Driveway Option B & C

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	3.1	2.7	3.5	2.7	15.2	5.5
Denied Del/Veh (s)	1.3	1.2	1.5	1.2	6.3	2.3
Total Delay (hr)	170.7	138.3	156.3	154.8	236.6	171.3
Total Del/Veh (s)	69.7	56.7	63.1	62.7	94.9	69.5
Stop Del/Veh (s)	48.2	36.6	41.8	41.2	71.0	47.8
Stop/Veh	1.69	1.52	1.57	1.59	1.91	1.66
Travel Dist (mi)	6197.5	6171.0	6310.0	6292.9	6403.8	6275.0
Travel Time (hr)	358.5	324.5	347.3	344.4	441.7	363.3
Avg Speed (mph)	17	19	18	18	15	18
Vehicles Entered	8444	8446	8581	8529	8648	8534
Vehicles Exited	8411	8455	8544	8551	8554	8503
Hourly Exit Rate	8411	8455	8544	8551	8554	8503
Input Volume	48400	48400	48400	48400	48400	48400
% of Volume	17	17	18	18	18	18
Denied Entry Before	1	1	3	3	4	1
Denied Entry After	3	2	3	3	71	15

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	4.7	16.2	0.2	37	39	4.1
	80	2.4	13.8	0.2	40	42	2.0
	107	2.5	13.7	0.2	41	42	2.1
Bass Pro Dr/Domingue	12	2.6	4.8	0.0	25	26	2.4
Schriber Way	11	1.7	9.5	0.1	32	32	1.6
I-80 EB Ramps	10	19.8	26.1	0.1	11	11	19.9
I-80 EB On Ramp	101	3.6	12.2	0.1	35	35	3.5
I-80 WB On Ramp	99	0.6	10.8	0.1	39	39	0.5
I-80 WB Ramps	9	13.8	22.3	0.1	16	18	11.1
Granite Dr	8	22.9	30.8	0.1	11	14	16.3
Project Driveway	24	46.6	61.1	0.1	8	9	45.4
Dwy S of Brace Rd	21	16.4	22.6	0.1	11	8	26.1
Brace Rd	7	24.6	29.8	0.1	7	5	36.0
Taylor Rd	6	57.9	68.7	0.1	7	5	71.8
Total		220.0	342.4	1.5	16	15	243.0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	38	4.4	36	5.0	37	4.7	36
	41	2.2	40	2.6	40	2.5	39
	41	2.4	41	2.5	40	2.6	39
Bass Pro Dr/Domingue	26	2.4	25	2.6	26	2.4	22
Schriber Way	32	1.7	32	1.7	32	1.7	31
I-80 EB Ramps	10	20.4	10	20.1	11	19.0	11
I-80 EB On Ramp	34	3.7	35	3.4	35	3.6	34
I-80 WB On Ramp	39	0.5	39	0.6	39	0.6	38
I-80 WB Ramps	18	11.8	16	13.0	18	11.1	11
Granite Dr	13	16.9	14	15.8	14	15.9	6
Project Driveway	16	19.8	15	20.7	12	28.8	4
Dwy S of Brace Rd	21	5.8	22	5.2	13	12.5	6
Brace Rd	10	16.7	11	13.6	8	20.8	5
Taylor Rd	8	46.5	7	54.3	7	49.6	6
Total	19	155.2	19	161.0	18	175.9	11

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	43.3	118.5	1.0	29	29	43.6
Brace Rd	7	7.2	18.8	0.1	24	24	7.4
Dwy S of Brace Rd	21	2.1	7.4	0.1	28	28	2.1
Project Driveway	24	7.8	13.7	0.1	18	17	8.7
Granite Dr	8	31.9	43.8	0.1	11	13	27.3
I-80 WB Ramps	9	38.1	46.2	0.1	7	8	36.0
I-80 WB On Ramp	99	4.5	12.0	0.1	25	25	4.6
I-80 EB On Ramp	101	0.8	10.5	0.1	40	41	0.8
I-80 EB Ramps	10	10.3	20.6	0.1	21	20	10.7
Schriber Way	11	2.4	9.5	0.1	29	29	2.5
Bass Pro Dr/Domingue	12	3.1	10.4	0.1	29	29	3.0
	107	1.0	4.1	0.0	29	30	0.9
	80	1.1	12.6	0.2	44	44	1.2
Stadium Dwy	13	4.2	15.0	0.2	37	37	4.4
Total		157.9	343.0	2.3	24	24	153.2

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	29	46.6	31	36.7	29	45.4	29
Brace Rd	25	7.0	25	6.6	23	8.2	25
Dwy S of Brace Rd	28	2.0	28	2.1	28	2.1	28
Project Driveway	19	7.1	18	8.4	19	7.6	19
Granite Dr	14	24.0	9	40.8	11	32.1	11
I-80 WB Ramps	9	29.7	6	44.1	7	37.2	6
I-80 WB On Ramp	26	4.4	25	4.6	26	4.4	25
I-80 EB On Ramp	41	0.8	40	0.9	40	0.8	41
I-80 EB Ramps	22	9.1	20	10.9	20	10.5	21
Schriber Way	30	2.1	28	2.6	28	2.6	30
Bass Pro Dr/Domingue	30	2.9	28	3.7	29	3.2	30
	30	0.9	28	1.1	28	1.1	30
	45	1.0	44	1.2	44	1.1	44
Stadium Dwy	36	4.6	38	3.8	37	4.3	37
Total	25	142.1	23	167.4	24	160.5	23

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	2.3	3.3	2.5	2.8	2.6	2.7
Denied Del/Veh (s)	1.1	1.6	1.2	1.3	1.3	1.3
Total Delay (hr)	97.0	106.7	103.7	108.9	100.5	103.4
Total Del/Veh (s)	46.2	49.9	48.4	50.9	47.5	48.6
Stop Del/Veh (s)	31.3	34.2	33.1	35.4	32.4	33.3
Stop/Veh	1.43	1.46	1.42	1.44	1.40	1.43
Travel Dist (mi)	4913.2	5022.7	4960.2	4972.9	4883.8	4950.6
Travel Time (hr)	253.8	268.1	262.4	268.5	257.2	262.0
Avg Speed (mph)	20	19	19	19	19	19
Vehicles Entered	7319	7441	7456	7481	7370	7414
Vehicles Exited	7305	7417	7412	7450	7375	7392
Hourly Exit Rate	7305	7417	7412	7450	7375	7392
Input Volume	39873	39873	39873	39873	39873	39873
% of Volume	18	19	19	19	18	19
Denied Entry Before	2	2	3	10	1	2
Denied Entry After	2	0	2	3	0	0

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	2.0	16.3	0.2	36	37	1.9
	80	1.1	15.3	0.2	36	36	1.0
	107	1.5	15.5	0.2	36	36	1.4
Bass Pro Dr/Domingue	12	2.8	5.6	0.0	21	22	2.7
Schriber Way	11	1.6	9.4	0.1	32	32	1.6
I-80 EB Ramps	10	20.2	26.3	0.1	10	10	20.3
I-80 EB On Ramp	101	3.7	13.3	0.1	32	32	3.6
I-80 WB On Ramp	99	0.6	10.8	0.1	39	39	0.5
I-80 WB Ramps	9	11.8	19.1	0.1	17	18	10.9
Granite Dr	8	16.5	24.5	0.1	13	13	17.0
Project Driveway	24	18.9	30.7	0.1	16	16	20.1
Dwy S of Brace Rd	21	3.3	9.3	0.1	26	26	3.4
Brace Rd	7	5.7	10.8	0.1	19	20	5.1
Taylor Rd	6	24.7	35.6	0.1	13	12	26.3
Total		114.3	242.6	1.5	22	22	115.8

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	37	1.8	37	1.8	36	2.1	36
	36	1.1	36	1.0	36	1.2	36
	36	1.5	36	1.6	36	1.5	36
Bass Pro Dr/Domingue	20	3.1	20	3.1	22	2.5	22
Schriber Way	32	1.7	32	1.7	33	1.5	32
I-80 EB Ramps	10	20.6	11	20.1	11	19.4	10
I-80 EB On Ramp	31	3.9	32	3.5	32	3.6	31
I-80 WB On Ramp	39	0.7	39	0.5	39	0.5	39
I-80 WB Ramps	18	11.3	17	12.0	16	12.8	17
Granite Dr	14	15.2	14	15.6	13	17.2	13
Project Driveway	15	20.6	18	16.7	17	18.5	17
Dwy S of Brace Rd	26	3.5	27	3.0	26	3.5	27
Brace Rd	18	6.2	19	5.9	18	6.4	21
Taylor Rd	12	25.6	13	23.9	12	25.6	14
Total	22	116.8	22	110.4	22	116.1	22

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	33.9	108.7	1.0	32	32	32.4
Brace Rd	7	5.6	17.1	0.1	26	26	5.7
Dwy S of Brace Rd	21	1.6	6.9	0.1	30	31	1.5
Project Driveway	24	7.4	12.9	0.1	19	19	7.0
Granite Dr	8	19.1	31.0	0.1	16	17	18.2
I-80 WB Ramps	9	37.2	45.3	0.1	7	8	32.0
I-80 WB On Ramp	99	4.7	12.2	0.1	25	25	4.5
I-80 EB On Ramp	101	0.7	10.4	0.1	41	41	0.7
I-80 EB Ramps	10	9.3	20.3	0.1	21	21	9.2
Schriber Way	11	2.2	9.2	0.1	30	30	2.2
Bass Pro Dr/Domingue	12	2.4	9.7	0.1	31	33	1.9
	107	0.7	4.1	0.0	30	31	0.6
	80	0.7	14.8	0.2	38	38	0.6
Stadium Dwy	13	2.2	15.9	0.2	35	37	1.5
Total		127.6	318.6	2.3	26	26	118.1

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	32	33.7	33	32.1	31	36.3	31
Brace Rd	26	5.9	27	4.9	26	5.6	26
Dwy S of Brace Rd	30	1.7	31	1.5	29	1.7	31
Project Driveway	18	7.6	18	7.7	19	7.6	20
Granite Dr	16	20.2	17	17.8	15	21.3	17
I-80 WB Ramps	7	37.3	7	41.7	7	41.3	8
I-80 WB On Ramp	25	4.8	25	4.7	25	4.8	26
I-80 EB On Ramp	41	0.7	41	0.8	41	0.8	41
I-80 EB Ramps	20	9.9	21	9.3	20	9.7	22
Schriber Way	30	2.2	30	2.2	30	2.2	30
Bass Pro Dr/Domingue	30	2.6	30	2.7	31	2.4	32
	30	0.8	29	0.9	30	0.8	30
	38	0.6	38	0.7	38	0.7	38
Stadium Dwy	35	2.2	35	2.5	34	2.5	35
Total	25	130.1	26	129.6	25	137.8	26

Cumulative Conditions – Long Term Baseline

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	537.9	449.6	520.6	642.3	571.2	544.3
Denied Del/Veh (s)	179.5	152.6	171.5	209.7	191.1	181.1
Total Delay (hr)	407.0	533.1	523.2	535.0	480.0	495.6
Total Del/Veh (s)	142.2	187.9	180.1	189.6	170.0	173.9
Stop Del/Veh (s)	109.9	148.2	140.8	149.2	134.9	136.5
Stop/Veh	2.02	2.42	2.29	2.45	2.21	2.28
Travel Dist (mi)	6793.9	6755.0	6753.3	6713.7	6637.4	6730.7
Travel Time (hr)	1138.6	1175.7	1237.2	1368.9	1240.1	1232.1
Avg Speed (mph)	11	9	9	9	10	10
Vehicles Entered	9798	9742	9946	9673	9660	9765
Vehicles Exited	9511	9432	9494	9241	9187	9377
Hourly Exit Rate	9511	9432	9494	9241	9187	9377
Input Volume	61845	61845	61845	61845	61845	61845
% of Volume	15	15	15	15	15	15
Denied Entry Before	56	8	40	49	80	45
Denied Entry After	989	868	984	1352	1100	1054

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	28.0	42.6	0.2	15	40	3.4
	80	59.3	70.6	0.2	8	25	10.9
	107	63.4	71.0	0.1	5	8	38.5
Bass Pro Dr/Domingue	12	23.6	29.4	0.1	10	10	23.4
Schriber Way	11	5.8	13.3	0.1	23	26	3.9
I-80 EB Ramps	10	22.7	28.9	0.1	10	10	20.3
I-80 EB On Ramp	101	3.4	12.6	0.1	33	34	3.1
I-80 WB On Ramp	99	1.2	11.4	0.1	37	36	1.5
I-80 WB Ramps	9	24.1	34.9	0.1	10	8	32.2
Granite Dr	8	22.1	30.3	0.1	11	11	20.7
Commercial Developme	24	3.3	15.1	0.1	32	33	3.1
Dwy S of Brace Rd	21	1.4	7.7	0.1	34	34	1.4
Brace Rd	7	11.0	16.2	0.1	13	12	12.1
Taylor Rd	6	21.9	33.1	0.1	14	13	24.0
Total		291.2	417.2	1.5	13	17	198.5

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	7	71.2	25	12.6	12	37.2	19
	5	92.9	7	72.5	7	69.9	8
	4	83.2	5	74.5	5	72.1	6
Bass Pro Dr/Domingue	9	25.4	10	24.7	9	25.8	12
Schriber Way	23	5.9	23	5.7	20	7.6	22
I-80 EB Ramps	9	23.6	10	22.1	9	24.7	9
I-80 EB On Ramp	34	3.2	33	3.5	33	3.6	33
I-80 WB On Ramp	39	0.7	36	1.4	37	1.2	38
I-80 WB Ramps	13	17.5	10	23.5	10	23.2	10
Granite Dr	11	22.2	11	23.0	11	22.0	11
Commercial Developme	31	3.6	32	3.3	32	3.2	32
Dwy S of Brace Rd	34	1.4	34	1.3	33	1.5	35
Brace Rd	13	10.6	13	10.8	12	11.9	14
Taylor Rd	13	23.0	15	20.0	15	20.0	13
Total	11	384.3	13	298.8	12	323.9	14

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	123.2	162.3	0.5	11	19	56.4
Brace Rd	7	19.3	30.7	0.1	15	15	18.5
Dwy S of Brace Rd	21	10.1	15.4	0.1	14	17	7.4
Commercial Developme	24	26.9	33.6	0.1	8	11	16.6
Granite Dr	8	102.8	118.3	0.1	4	5	83.7
I-80 WB Ramps	9	35.0	44.5	0.1	8	8	35.2
I-80 WB On Ramp	99	3.9	10.5	0.1	29	30	3.8
I-80 EB On Ramp	101	6.7	16.4	0.1	26	24	7.7
I-80 EB Ramps	10	65.3	813.6	0.1	6	6	64.3
	11	27.5	36.7	0.1	8	8	28.0
Bass Pro Dr/Domingue	12	33.5	41.2	0.1	7	7	33.6
	107	6.0	12.6	0.1	23	23	5.9
	80	2.3	10.2	0.1	38	37	2.5
Stadium Dwy	13	5.4	15.9	0.2	35	35	5.5
Total		468.0	1361.8	1.8	11	13	368.9

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	12	108.1	8	193.1	10	144.2	13
Brace Rd	17	14.9	18	13.8	15	17.9	10
Dwy S of Brace Rd	13	11.1	16	7.8	13	10.3	11
Commercial Developme	6	36.9	9	22.4	7	32.9	9
Granite Dr	4	111.0	4	96.4	4	117.1	4
I-80 WB Ramps	9	31.1	9	30.8	7	37.2	7
I-80 WB On Ramp	29	4.0	30	3.7	29	4.1	29
I-80 EB On Ramp	26	6.6	29	4.7	23	8.5	27
I-80 EB Ramps	6	67.0	6	66.1	6	66.7	6
	8	26.8	8	27.4	8	28.4	8
Bass Pro Dr/Domingue	7	34.6	8	32.4	7	34.3	8
	23	6.0	22	6.3	23	5.8	23
	38	2.3	38	2.3	39	2.0	38
Stadium Dwy	32	6.9	37	4.5	34	5.7	37
Total	11	467.4	10	511.7	10	515.1	11

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	1280.3	1079.2	963.2	1031.3	963.7	1063.5
Denied Del/Veh (s)	325.3	273.3	243.1	263.6	250.8	271.4
Total Delay (hr)	735.9	719.2	699.2	690.2	656.8	700.3
Total Del/Veh (s)	212.7	201.1	194.9	196.8	187.4	198.6
Stop Del/Veh (s)	169.4	155.8	151.1	153.2	142.9	154.5
Stop/Veh	2.58	2.56	2.54	2.54	2.54	2.56
Travel Dist (mi)	7533.3	7812.7	7777.5	7581.4	7754.3	7691.8
Travel Time (hr)	2233.5	2023.3	1888.2	1940.5	1844.8	1986.0
Avg Speed (mph)	8	8	8	8	9	8
Vehicles Entered	11626	12135	12185	11915	11912	11954
Vehicles Exited	11418	11863	11972	11616	11724	11718
Hourly Exit Rate	11418	11863	11972	11616	11724	11718
Input Volume	78883	78883	78883	78883	78883	78883
% of Volume	14	15	15	15	15	15
Denied Entry Before	100	129	98	121	88	102
Denied Entry After	2544	2079	2079	2170	1920	2156

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	78.3	332.9	0.2	7	6	86.4
	80	58.9	70.1	0.2	8	7	63.5
	107	50.1	58.1	0.1	7	7	53.1
Bass Pro Dr/Domingue	12	40.3	45.8	0.1	6	6	40.5
Schriber Way	11	29.1	36.8	0.1	8	8	28.0
I-80 EB Ramps	10	42.1	49.1	0.1	6	5	46.2
I-80 EB On Ramp	101	4.4	12.2	0.1	35	34	4.4
I-80 WB On Ramp	99	2.1	12.3	0.1	34	34	2.1
I-80 WB Ramps	9	34.1	818.6	0.1	8	6	42.2
Granite Dr	8	35.8	44.5	0.1	8	6	44.5
Commercial Developme	24	20.7	32.6	0.1	15	16	17.4
Dwy S of Brace Rd	21	23.3	30.2	0.1	9	11	17.8
Brace Rd	7	23.3	28.7	0.1	7	8	21.4
Taylor Rd	6	29.1	40.0	0.1	11	12	27.7
Total		471.5	1611.8	1.5	9	9	495.2

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	7	76.0	7	75.0	6	81.5	7
	9	53.7	8	59.7	8	61.7	8
	7	45.9	7	51.5	7	51.4	7
Bass Pro Dr/Domingue	6	37.7	6	40.2	6	40.0	6
Schriber Way	8	29.3	9	27.0	8	30.6	8
I-80 EB Ramps	6	36.9	6	42.6	6	42.0	6
I-80 EB On Ramp	35	4.3	35	4.2	34	4.7	35
I-80 WB On Ramp	34	2.2	34	2.3	35	1.9	35
I-80 WB Ramps	8	35.3	9	29.3	8	34.0	9
Granite Dr	8	33.1	8	32.5	7	37.6	8
Commercial Developme	16	18.9	11	30.1	14	23.1	19
Dwy S of Brace Rd	9	23.5	7	30.4	9	24.4	10
Brace Rd	7	23.6	7	25.7	7	23.1	8
Taylor Rd	11	28.6	11	31.4	11	29.5	12
Total	9	448.9	9	481.9	9	485.4	9

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	128.9	163.0	0.4	10	11	110.3
Brace Rd	7	21.5	36.3	0.1	14	15	19.4
Dwy S of Brace Rd	21	1.7	7.0	0.1	30	30	1.8
Commercial Developme	24	1.2	7.9	0.1	34	30	2.3
Granite Dr	8	40.3	51.6	0.1	9	6	67.8
I-80 WB Ramps	9	43.8	52.6	0.1	6	5	53.4
I-80 WB On Ramp	99	3.7	10.1	0.1	30	29	4.0
I-80 EB On Ramp	101	2.7	12.3	0.1	34	34	2.7
I-80 EB Ramps	10	65.6	285.5	0.1	6	5	68.0
	11	43.9	51.0	0.1	5	6	43.1
Bass Pro Dr/Domingue	12	48.4	55.8	0.1	5	5	48.3
	107	6.0	12.2	0.1	23	23	5.8
	80	1.9	10.1	0.1	40	40	1.8
Stadium Dwy	13	10.2	21.1	0.2	26	26	10.5
Total		419.7	776.8	1.7	11	11	439.3

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	7	208.0	11	114.7	10	127.7	14
Brace Rd	13	23.3	14	20.8	14	22.0	13
Dwy S of Brace Rd	30	1.7	30	1.7	30	1.6	30
Commercial Developme	36	0.8	35	0.9	36	0.7	34
Granite Dr	11	31.1	11	30.3	11	30.3	9
I-80 WB Ramps	6	44.6	7	41.7	7	39.4	7
I-80 WB On Ramp	30	3.6	30	3.8	32	3.3	30
I-80 EB On Ramp	33	3.1	37	1.8	35	2.4	32
I-80 EB Ramps	6	56.6	6	65.7	5	69.0	5
	6	42.4	5	44.0	5	46.1	5
Bass Pro Dr/Domingue	6	44.3	5	49.9	5	49.8	5
	23	5.9	23	5.9	22	6.0	22
	40	1.9	39	2.0	40	1.9	40
Stadium Dwy	25	11.2	26	10.3	28	9.3	27
Total	10	478.5	12	393.4	11	409.7	12

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	337.0	350.1	353.8	150.6	282.7	294.8
Denied Del/Veh (s)	101.1	105.6	106.8	46.0	86.3	89.3
Total Delay (hr)	348.7	362.6	353.8	326.4	349.2	348.1
Total Del/Veh (s)	105.8	110.4	109.7	98.0	107.1	106.2
Stop Del/Veh (s)	82.1	86.3	85.5	74.6	82.5	82.2
Stop/Veh	1.78	1.82	1.82	1.74	1.78	1.79
Travel Dist (mi)	6889.0	6911.0	6802.1	6979.0	6882.0	6892.6
Travel Time (hr)	893.5	920.5	911.7	686.6	839.0	850.3
Avg Speed (mph)	12	12	12	13	12	12
Vehicles Entered	11403	11328	11117	11526	11218	11316
Vehicles Exited	11257	11190	10999	11403	11179	11208
Hourly Exit Rate	11257	11190	10999	11403	11179	11208
Input Volume	59592	59592	59592	59592	59592	59592
% of Volume	19	19	18	19	19	19
Denied Entry Before	121	47	55	11	37	52
Denied Entry After	603	611	813	269	580	573

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	12.3	24.2	0.2	25	15	28.9
	80	25.9	37.2	0.2	15	10	42.7
	107	35.6	42.4	0.1	8	7	43.2
Bass Pro Dr/Domingue	12	31.5	74.8	0.1	9	8	34.3
Schriber Way	11	10.4	18.1	0.1	17	17	10.2
I-80 EB Ramps	10	31.5	37.9	0.1	7	8	28.2
I-80 EB On Ramp	101	3.5	12.1	0.1	35	36	3.2
I-80 WB On Ramp	99	1.7	11.9	0.1	36	36	1.6
I-80 WB Ramps	9	17.4	284.4	0.1	13	13	18.4
Granite Dr	8	21.7	29.6	0.1	11	11	21.6
Commercial Developme	24	5.5	17.0	0.1	27	27	5.6
Dwy S of Brace Rd	21	5.3	12.6	0.1	23	21	6.0
Brace Rd	7	16.2	21.4	0.1	10	10	16.0
Taylor Rd	6	28.1	38.9	0.1	12	10	33.0
Total		246.4	662.3	1.5	15	13	292.9

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	26	11.7	33	6.8	31	7.3	33
	15	26.1	20	16.7	21	15.3	14
	8	36.4	10	27.7	10	28.1	7
Bass Pro Dr/Domingue	9	30.8	10	28.4	9	31.9	9
Schriber Way	19	8.1	15	12.2	17	9.7	16
I-80 EB Ramps	7	31.2	6	39.0	9	25.8	7
I-80 EB On Ramp	35	3.5	34	4.1	35	3.3	35
I-80 WB On Ramp	35	2.0	36	1.6	36	1.4	35
I-80 WB Ramps	13	17.4	15	14.4	13	18.5	13
Granite Dr	10	26.4	12	19.3	12	20.6	12
Commercial Developme	27	5.8	28	5.1	26	5.9	28
Dwy S of Brace Rd	25	4.4	25	4.2	21	6.3	22
Brace Rd	10	15.1	10	15.8	9	17.1	9
Taylor Rd	11	28.6	11	29.1	12	27.1	14
Total	15	247.6	15	224.4	16	218.5	14

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	29.3	77.0	0.6	29	28	31.0
Brace Rd	7	6.8	18.4	0.1	25	25	6.4
Dwy S of Brace Rd	21	1.3	6.7	0.1	31	32	1.2
Commercial Developme	24	0.8	7.9	0.1	36	36	0.7
Granite Dr	8	26.3	37.1	0.1	12	13	24.0
I-80 WB Ramps	9	51.8	60.2	0.1	6	5	53.4
I-80 WB On Ramp	99	4.3	10.9	0.1	28	28	4.2
I-80 EB On Ramp	101	1.9	11.6	0.1	36	41	0.6
I-80 EB Ramps	10	28.6	47.7	0.1	11	17	15.3
	11	36.8	51.7	0.1	6	8	30.1
Bass Pro Dr/Domingue	12	72.6	79.8	0.1	4	4	70.4
	107	6.3	13.7	0.1	24	25	6.1
	80	1.1	8.1	0.1	42	42	1.1
Stadium Dwy	13	5.9	16.7	0.2	33	34	5.7
Total		273.9	447.5	1.9	16	17	250.2

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	28	29.6	29	27.3	28	29.5	29
Brace Rd	25	6.3	27	5.2	25	6.7	22
Dwy S of Brace Rd	31	1.3	32	1.1	32	1.3	30
Commercial Developme	35	0.9	37	0.6	37	0.7	36
Granite Dr	8	44.6	15	19.9	15	19.7	14
I-80 WB Ramps	5	63.4	6	46.9	6	47.5	6
I-80 WB On Ramp	28	4.3	28	4.3	28	4.3	28
I-80 EB On Ramp	41	0.7	25	7.1	41	0.7	41
I-80 EB Ramps	13	21.8	5	68.6	15	18.9	14
	7	33.6	5	49.7	7	33.6	6
Bass Pro Dr/Domingue	4	71.4	4	75.8	4	69.3	4
	24	6.3	24	6.4	24	6.3	24
	43	1.0	42	1.2	42	1.1	42
Stadium Dwy	33	6.2	33	6.1	33	5.9	34
Total	15	291.4	15	320.2	17	245.6	16

Cumulative Conditions – Long Term Plus Project

Project Driveway Option A

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	268.0	348.1	317.1	304.6	330.8	313.7
Denied Del/Veh (s)	94.7	125.9	112.0	108.2	116.3	111.4
Total Delay (hr)	721.1	698.0	674.9	690.1	687.4	694.3
Total Del/Veh (s)	271.1	273.8	254.5	268.1	262.5	266.0
Stop Delay (hr)	640.1	616.1	596.3	617.0	611.9	616.3
Stop Del/Veh (s)	240.7	241.7	224.8	239.7	233.7	236.1
Stop/Veh	2.82	2.99	2.70	2.76	2.76	2.81
Travel Dist (mi)	6551.2	6426.4	6531.9	6349.3	6621.6	6496.1
Travel Time (hr)	1224.0	1276.3	1226.1	1222.0	1256.1	1240.9
Avg Speed (mph)	7	7	7	7	7	7
Vehicles Entered	9155	8819	9208	8939	9077	9038
Vehicles Exited	8307	8002	8345	8048	8281	8196
Hourly Exit Rate	8307	8002	8345	8048	8281	8196
Input Volume	67026	67026	67026	67026	67026	67026
% of Volume	12	12	12	12	12	12
Denied Entry Before	4	3	3	3	4	2
Denied Entry After	1035	1134	984	1198	1165	1102

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	7.0	26.5	0.2	23	16	19.4
	80	26.4	45.0	0.2	12	8	53.3
	107	67.9	83.9	0.1	6	4	94.4
Bass Pro Dr/Domingue	12	17.8	23.8	0.1	8	7	19.4
Schriber Way	11	4.7	14.6	0.1	21	21	4.4
I-80 EB Ramps	10	18.3	26.4	0.1	10	10	19.7
I-80 EB On Ramp	101	2.4	15.6	0.1	27	27	2.4
I-80 WB On Ramp	99	3.9	17.6	0.1	24	28	1.4
I-80 WB Ramps	9	24.7	36.3	0.1	9	10	20.4
Granite Dr	8	26.0	37.0	0.1	9	9	25.8
Project Driveway	24	6.8	21.7	0.1	21	20	8.0
Dwy S of Brace Rd	21	1.5	11.0	0.1	26	25	1.8
Brace Rd	7	11.7	18.4	0.1	11	12	10.0
Taylor Rd	6	22.2	36.7	0.1	12	12	22.9
Total		241.4	414.6	1.5	13	11	303.3

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	28	1.8	23	7.2	26	4.1	28
	18	11.7	8	48.3	16	17.0	27
	5	83.0	5	83.5	7	56.7	12
Bass Pro Dr/Domingue	8	18.4	8	16.7	8	17.5	8
Schriber Way	21	4.4	22	4.0	19	5.9	21
I-80 EB Ramps	11	17.6	12	15.4	11	17.1	9
I-80 EB On Ramp	27	2.4	28	2.1	27	2.4	26
I-80 WB On Ramp	29	0.8	29	0.9	29	1.2	15
I-80 WB Ramps	13	13.6	11	18.0	10	21.2	5
Granite Dr	13	15.0	9	25.1	8	29.9	7
Project Driveway	22	5.9	23	5.6	22	5.8	20
Dwy S of Brace Rd	27	1.3	27	1.3	27	1.2	25
Brace Rd	11	11.3	11	11.6	12	10.2	9
Taylor Rd	12	22.2	11	26.6	14	18.7	13
Total	14	209.5	12	266.5	14	209.0	14

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	347.9	671.7	0.5	5	5	347.1
Brace Rd	7	130.0	144.8	0.1	3	3	138.1
Dwy S of Brace Rd	21	46.8	54.1	0.1	4	4	47.7
	24	88.8	100.5	0.1	3	3	88.2
Granite Dr	8	145.4	162.2	0.1	3	3	148.1
I-80 WB Ramps	9	50.8	64.3	0.1	5	5	53.9
I-80 WB On Ramp	99	22.8	35.6	0.1	9	10	21.3
I-80 EB On Ramp	101	40.3	53.1	0.1	8	8	38.3
I-80 EB Ramps	10	72.0	88.1	0.1	5	5	68.0
	11	23.3	33.3	0.1	9	8	24.4
Bass Pro Dr/Domingue	12	29.9	39.9	0.1	8	8	30.7
	107	3.3	10.1	0.1	19	19	3.3
	80	2.7	19.1	0.1	26	26	2.6
Stadium Dwy	13	5.1	22.6	0.2	25	25	4.8
Total		1009.1	1499.3	1.8	5	5	1016.4

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	5	310.8	5	343.8	4	384.9	4
Brace Rd	3	114.5	3	118.8	3	140.1	3
Dwy S of Brace Rd	4	40.6	4	45.7	4	51.3	4
	3	79.4	3	88.6	3	96.5	3
Granite Dr	3	127.7	3	144.9	3	159.1	3
I-80 WB Ramps	5	50.2	6	42.6	5	52.5	5
I-80 WB On Ramp	7	33.0	12	16.2	9	23.4	11
I-80 EB On Ramp	6	55.3	9	35.6	8	39.5	9
I-80 EB Ramps	5	78.2	5	74.2	5	70.1	5
	8	24.5	9	22.0	8	24.0	9
Bass Pro Dr/Domingue	7	31.9	8	28.6	8	29.1	8
	19	3.2	19	3.2	19	3.1	18
	26	2.8	25	2.8	26	2.7	26
Stadium Dwy	25	4.4	24	6.3	25	4.7	25
Total	6	956.5	6	973.5	5	1081.0	5

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	1072.4	1016.9	1030.2	1071.2	1077.9	1053.7
Denied Del/Veh (s)	295.8	284.0	290.6	302.2	304.6	295.3
Total Delay (hr)	985.4	995.1	966.8	1035.5	957.0	987.9
Total Del/Veh (s)	335.8	335.1	331.0	358.0	331.5	338.3
Stop Delay (hr)	881.0	886.0	869.9	927.3	859.7	884.8
Stop Del/Veh (s)	300.2	298.4	297.8	320.6	297.8	303.0
Stop/Veh	3.40	3.45	3.36	3.55	3.31	3.41
Travel Dist (mi)	7322.9	7475.9	7337.9	7249.8	7198.8	7317.0
Travel Time (hr)	2322.2	2282.0	2261.5	2368.3	2295.4	2305.9
Avg Speed (mph)	6	6	6	6	6	6
Vehicles Entered	10092	10174	10032	9910	9890	10021
Vehicles Exited	9077	9291	9108	8924	8935	9066
Hourly Exit Rate	9077	9291	9108	8924	8935	9066
Input Volume	89237	89237	89237	89237	89237	89237
% of Volume	10	10	10	10	10	10
Denied Entry Before	7	12	5	7	9	6
Denied Entry After	2961	2715	2729	2853	2849	2823

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	143.5	1373.0	0.2	4	4	148.2
	80	102.9	121.3	0.2	5	5	102.5
	107	110.1	126.0	0.1	4	4	107.4
Bass Pro Dr/Domingue	12	62.6	69.4	0.1	3	3	62.1
Schriber Way	11	98.6	109.0	0.1	3	3	94.4
I-80 EB Ramps	10	94.6	107.3	0.1	3	3	88.6
I-80 EB On Ramp	101	149.6	167.9	0.1	3	3	135.6
I-80 WB On Ramp	99	130.9	144.3	0.1	3	3	123.9
I-80 WB Ramps	9	109.7	122.9	0.1	3	3	105.8
Granite Dr	8	54.1	66.1	0.1	5	5	54.7
Project Driveway	24	16.2	31.5	0.1	15	14	16.4
Dwy S of Brace Rd	21	5.3	15.1	0.1	19	18	5.7
Brace Rd	7	25.1	31.9	0.1	7	7	23.8
Taylor Rd	6	27.3	41.9	0.1	11	12	23.3
Total		1130.6	2527.8	1.5	4	4	1092.2

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	4	142.7	4	145.2	3	150.0	4
	5	98.7	5	105.0	4	107.2	5
	4	109.0	4	114.3	4	112.7	4
Bass Pro Dr/Domingue	3	62.9	3	65.4	3	64.4	3
Schriber Way	3	94.5	3	99.9	2	112.0	3
I-80 EB Ramps	3	95.1	3	94.7	2	102.5	3
I-80 EB On Ramp	3	148.8	2	155.8	2	157.7	3
I-80 WB On Ramp	3	126.9	3	134.8	3	135.0	3
I-80 WB Ramps	3	103.6	3	111.8	2	115.9	3
Granite Dr	5	53.7	6	47.5	5	52.4	5
Project Driveway	15	15.4	16	13.9	14	18.5	14
Dwy S of Brace Rd	19	5.4	19	5.2	18	5.9	20
Brace Rd	7	24.4	6	25.9	6	28.5	7
Taylor Rd	10	31.9	11	28.3	10	32.3	13
Total	4	1113.0	4	1147.8	4	1194.9	4

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	62.3	113.5	0.4	14	13	72.8
Brace Rd	7	54.4	69.5	0.1	7	5	80.2
Dwy S of Brace Rd	21	36.6	43.8	0.1	5	4	43.6
	24	78.8	88.1	0.1	3	3	78.0
Granite Dr	8	122.1	136.7	0.1	3	3	118.0
I-80 WB Ramps	9	60.1	72.4	0.1	5	5	56.6
I-80 WB On Ramp	99	4.7	15.1	0.1	20	21	4.3
I-80 EB On Ramp	101	3.2	16.1	0.1	26	28	2.3
I-80 EB Ramps	10	26.1	40.9	0.1	10	9	31.2
	11	28.8	38.0	0.1	7	7	31.7
Bass Pro Dr/Domingue	12	35.9	45.7	0.1	7	7	34.4
	107	2.8	9.6	0.1	20	20	2.8
	80	1.8	18.2	0.1	27	27	1.8
Stadium Dwy	13	9.5	27.7	0.2	20	19	10.7
Total		527.0	735.3	1.7	9	8	568.3

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	16	46.4	14	63.1	12	86.8	17
Brace Rd	7	49.4	9	35.0	7	54.5	7
Dwy S of Brace Rd	5	35.9	6	25.6	5	37.8	4
	3	80.5	4	71.0	3	77.5	3
Granite Dr	3	122.6	3	117.5	3	121.1	3
I-80 WB Ramps	5	57.1	4	65.0	5	61.7	5
I-80 WB On Ramp	21	4.4	22	4.0	18	6.8	21
I-80 EB On Ramp	28	2.1	30	1.3	19	8.8	30
I-80 EB Ramps	10	29.5	14	14.8	8	36.5	13
	6	33.6	8	23.9	8	27.4	8
Bass Pro Dr/Domingue	6	40.9	7	33.3	7	32.3	6
	19	3.0	20	2.6	20	2.7	19
	27	1.8	27	1.7	27	1.8	27
Stadium Dwy	20	10.1	20	9.1	21	8.8	21
Total	9	517.2	9	468.0	8	564.5	9

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	360.0	476.3	609.3	429.5	461.7	467.4
Denied Del/Veh (s)	108.6	143.7	184.6	131.5	140.8	141.8
Total Delay (hr)	727.6	662.1	690.0	657.5	645.0	676.4
Total Del/Veh (s)	234.4	217.6	231.7	218.7	211.1	222.8
Stop Delay (hr)	633.5	574.8	602.4	574.7	561.2	589.3
Stop Del/Veh (s)	204.1	188.9	202.3	191.2	183.7	194.1
Stop/Veh	2.99	2.88	2.95	2.80	2.75	2.88
Travel Dist (mi)	7310.8	7221.8	7118.3	7170.6	7246.7	7213.7
Travel Time (hr)	1354.0	1401.3	1557.8	1348.0	1370.5	1406.3
Avg Speed (mph)	7	8	8	8	8	8
Vehicles Entered	10769	10564	10274	10409	10574	10519
Vehicles Exited	9927	9804	9593	9718	9824	9773
Hourly Exit Rate	9927	9804	9593	9718	9824	9773
Input Volume	70325	70325	70325	70325	70325	70325
% of Volume	14	14	14	14	14	14
Denied Entry Before	8	8	9	6	11	6
Denied Entry After	1171	1367	1611	1351	1230	1343

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	39.9	87.0	0.2	10	8	58.2
	80	42.0	60.7	0.2	9	7	63.8
	107	61.4	77.6	0.1	6	6	72.1
Bass Pro Dr/Domingue	12	27.5	33.7	0.1	6	5	29.8
Schriber Way	11	9.9	20.1	0.1	15	16	8.2
I-80 EB Ramps	10	28.7	37.2	0.1	7	8	26.4
I-80 EB On Ramp	101	35.9	51.6	0.1	8	7	47.4
I-80 WB On Ramp	99	52.4	65.9	0.1	6	6	58.7
I-80 WB Ramps	9	46.3	56.8	0.1	5	6	45.3
Granite Dr	8	47.1	57.6	0.1	6	6	43.7
Project Driveway	24	26.4	41.5	0.1	11	11	25.9
Dwy S of Brace Rd	21	3.4	13.2	0.1	22	21	3.6
Brace Rd	7	14.4	21.2	0.1	10	10	13.7
Taylor Rd	6	25.0	39.5	0.1	11	12	23.8
Total		460.0	663.8	1.5	8	8	520.7

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	7	67.4	24	6.3	7	64.2	24
	7	64.1	15	17.6	7	57.3	19
	6	71.1	7	56.6	6	67.6	9
Bass Pro Dr/Domingue	6	27.7	6	26.0	5	28.0	6
Schriber Way	15	9.7	16	8.2	16	8.2	12
I-80 EB Ramps	9	24.0	7	30.0	8	27.0	6
I-80 EB On Ramp	11	23.5	6	51.9	13	18.0	8
I-80 WB On Ramp	7	49.6	5	64.5	7	47.0	8
I-80 WB Ramps	6	44.0	5	52.2	5	49.8	6
Granite Dr	6	45.9	5	50.2	5	49.8	6
Project Driveway	12	22.5	10	29.1	11	26.4	11
Dwy S of Brace Rd	22	3.1	22	3.3	22	3.3	22
Brace Rd	10	14.6	10	14.8	10	13.5	9
Taylor Rd	12	24.2	11	25.0	11	25.4	11
Total	8	491.4	9	435.7	8	485.7	10

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	89.0	158.7	0.6	14	10	152.6
Brace Rd	7	96.3	111.5	0.1	4	4	109.4
Dwy S of Brace Rd	21	54.4	61.6	0.1	3	3	57.6
	24	107.2	116.5	0.1	2	2	111.5
Granite Dr	8	158.6	172.7	0.1	3	3	166.8
I-80 WB Ramps	9	60.6	72.1	0.1	5	4	64.0
I-80 WB On Ramp	99	3.5	14.0	0.1	22	22	3.7
I-80 EB On Ramp	101	1.0	13.8	0.1	31	31	1.0
I-80 EB Ramps	10	6.8	21.4	0.1	20	18	8.3
	11	14.7	23.5	0.1	12	10	19.2
Bass Pro Dr/Domingue	12	53.5	63.0	0.1	5	4	57.8
	107	2.8	9.5	0.1	19	19	2.8
	80	1.3	17.8	0.1	28	28	1.2
Stadium Dwy	13	5.9	23.8	0.2	23	23	6.2
Total		655.5	879.9	1.9	8	7	762.0

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	18	53.4	17	60.3	13	95.4	14
Brace Rd	4	98.6	4	89.1	4	89.2	4
Dwy S of Brace Rd	4	51.7	3	58.2	4	49.5	3
	3	103.4	2	113.2	3	100.5	2
Granite Dr	3	153.4	3	161.4	3	152.3	3
I-80 WB Ramps	5	56.9	5	58.9	5	61.4	5
I-80 WB On Ramp	21	3.7	22	3.4	22	3.2	22
I-80 EB On Ramp	31	1.0	31	1.0	30	1.0	31
I-80 EB Ramps	20	6.5	21	5.8	20	6.7	20
	12	15.7	13	12.9	13	12.6	13
Bass Pro Dr/Domingue	5	49.7	5	52.3	5	50.8	5
	20	2.8	19	2.8	19	2.9	20
	28	1.2	28	1.2	28	1.3	28
Stadium Dwy	24	5.3	24	5.6	23	6.7	24
Total	8	603.3	8	626.2	8	633.4	8

Project Driveway Option B & C

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	562.3	539.2	530.3	621.9	556.3	562.0
Denied Del/Veh (s)	177.7	171.0	166.8	194.5	173.6	176.8
Total Delay (hr)	502.0	462.0	497.9	556.7	526.7	509.1
Total Del/Veh (s)	168.9	154.7	163.5	186.5	174.5	169.6
Stop Del/Veh (s)	134.6	121.7	129.1	150.2	138.1	134.7
Stop/Veh	2.28	2.21	2.25	2.37	2.38	2.30
Travel Dist (mi)	6770.5	6796.6	6912.4	6815.0	6936.2	6846.1
Travel Time (hr)	1258.5	1196.5	1227.1	1374.1	1281.7	1267.6
Avg Speed (mph)	10	10	10	9	10	10
Vehicles Entered	10212	10235	10406	10232	10350	10287
Vehicles Exited	9816	9930	10098	9780	10082	9941
Hourly Exit Rate	9816	9930	10098	9780	10082	9941
Input Volume	64281	64281	64281	64281	64281	64281
% of Volume	15	15	16	15	16	15
Denied Entry Before	35	43	71	32	31	42
Denied Entry After	1177	1118	1038	1281	1184	1155

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	6.8	18.6	0.2	33	27	10.1
	80	42.5	53.8	0.2	10	7	69.7
	107	54.5	62.3	0.1	6	5	69.5
Bass Pro Dr/Domingue	12	22.3	28.0	0.1	10	10	24.1
Schriber Way	11	5.6	13.1	0.1	23	23	5.7
I-80 EB Ramps	10	21.6	27.7	0.1	10	10	21.1
I-80 EB On Ramp	101	3.3	12.5	0.1	34	34	3.2
I-80 WB On Ramp	99	1.0	11.3	0.1	38	38	0.8
I-80 WB Ramps	9	20.1	32.4	0.1	12	12	19.8
Granite Dr	8	21.1	29.2	0.1	11	12	19.6
Project Driveway	24	8.6	20.3	0.1	24	23	9.0
Dwy S of Brace Rd	21	2.8	9.3	0.1	29	30	2.4
Brace Rd	7	12.6	17.7	0.1	12	16	7.8
Taylor Rd	6	22.3	41.1	0.1	14	14	22.5
Total		245.2	377.1	1.5	15	13	285.3

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	28	9.5	35	5.4	36	4.8	38
	11	38.3	13	32.5	11	40.7	13
	8	42.5	6	55.8	7	50.2	6
Bass Pro Dr/Domingue	11	20.1	10	22.8	10	22.1	10
Schriber Way	23	5.4	23	5.8	22	5.9	24
I-80 EB Ramps	12	16.8	10	21.5	9	25.8	10
I-80 EB On Ramp	35	2.8	34	3.4	32	3.7	34
I-80 WB On Ramp	39	0.7	38	0.8	35	1.8	38
I-80 WB Ramps	13	16.8	11	21.3	10	25.0	13
Granite Dr	12	19.2	11	20.8	11	23.2	11
Project Driveway	24	8.2	23	9.2	25	7.9	24
Dwy S of Brace Rd	32	1.9	29	2.8	24	4.4	29
Brace Rd	17	6.9	10	14.9	8	21.2	12
Taylor Rd	14	20.7	12	26.1	14	21.3	14
Total	16	209.8	15	243.1	14	257.9	15

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	97.3	136.6	0.5	13	18	63.4
Brace Rd	7	29.1	40.5	0.1	11	13	24.3
Dwy S of Brace Rd	21	20.2	25.6	0.1	8	9	19.1
	24	41.6	50.2	0.1	6	5	42.3
Granite Dr	8	93.1	105.3	0.1	5	4	97.7
I-80 WB Ramps	9	34.2	43.6	0.1	8	8	33.0
I-80 WB On Ramp	99	3.7	10.1	0.1	30	30	3.6
I-80 EB On Ramp	101	3.5	13.2	0.1	32	33	3.0
I-80 EB Ramps	10	60.3	612.4	0.1	6	6	60.6
	11	25.6	34.7	0.1	9	8	28.3
Bass Pro Dr/Domingue	12	33.2	40.9	0.1	7	7	35.5
	107	5.9	12.5	0.1	23	23	6.0
	80	2.3	10.2	0.1	38	38	2.3
Stadium Dwy	13	4.9	15.4	0.2	36	36	4.9
Total		454.8	1151.3	1.8	11	11	424.1

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	16	74.8	14	89.5	10	139.9	12
Brace Rd	17	14.4	11	28.6	8	43.3	10
Dwy S of Brace Rd	10	16.4	9	18.2	7	22.7	7
	5	44.2	6	36.3	6	38.6	5
Granite Dr	4	96.1	5	88.7	5	89.5	5
I-80 WB Ramps	8	32.5	8	34.1	7	38.3	8
I-80 WB On Ramp	30	3.8	31	3.5	30	3.6	30
I-80 EB On Ramp	31	3.9	32	3.5	33	3.3	32
I-80 EB Ramps	6	61.5	6	60.4	6	61.2	6
	8	27.4	9	23.1	9	25.5	9
Bass Pro Dr/Domingue	7	33.6	8	30.2	8	32.9	7
	23	5.8	23	5.9	23	5.9	23
	38	2.2	37	2.5	38	2.3	38
Stadium Dwy	35	5.2	38	4.2	33	6.3	38
Total	12	421.7	11	428.7	10	513.2	10

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	1140.5	1196.4	1227.7	1238.9	872.8	1135.3
Denied Del/Veh (s)	262.8	272.9	283.6	285.6	199.8	261.0
Total Delay (hr)	796.3	814.2	809.3	825.5	795.8	808.2
Total Del/Veh (s)	206.9	208.7	208.9	215.3	198.4	207.7
Stop Del/Veh (s)	162.8	163.9	164.6	171.4	154.2	163.4
Stop/Veh	2.68	2.69	2.72	2.67	2.68	2.69
Travel Dist (mi)	8009.6	8048.2	8066.7	7895.2	8321.6	8068.3
Travel Time (hr)	2169.7	2245.3	2272.8	2294.6	1912.6	2179.0
Avg Speed (mph)	8	8	8	7	8	8
Vehicles Entered	13030	13235	13071	12989	13663	13196
Vehicles Exited	12789	12969	12903	12649	13381	12936
Hourly Exit Rate	12789	12969	12903	12649	13381	12936
Input Volume	84529	84529	84529	84529	84529	84529
% of Volume	15	15	15	15	16	15
Denied Entry Before	119	70	143	43	23	79
Denied Entry After	2591	2546	2512	2627	2066	2465

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	76.7	360.7	0.2	7	7	71.9
	80	57.1	68.3	0.2	8	8	56.5
	107	49.6	57.5	0.1	7	7	48.6
Bass Pro Dr/Domingue	12	40.8	46.1	0.1	6	6	40.7
Schriber Way	11	26.9	34.6	0.1	9	9	26.6
I-80 EB Ramps	10	39.6	46.4	0.1	6	6	42.2
I-80 EB On Ramp	101	4.1	11.9	0.1	35	36	3.9
I-80 WB On Ramp	99	1.4	11.6	0.1	36	36	1.5
I-80 WB Ramps	9	36.4	590.2	0.1	7	7	38.6
Granite Dr	8	47.3	56.0	0.1	6	6	49.7
Project Driveway	24	23.8	35.8	0.1	13	13	25.0
Dwy S of Brace Rd	21	12.3	19.1	0.1	14	16	10.2
Brace Rd	7	23.1	28.3	0.1	7	8	21.4
Taylor Rd	6	33.0	43.9	0.1	10	10	34.9
Total		472.0	1410.4	1.5	9	9	471.7

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	7	76.7	6	81.2	6	79.9	7
	8	56.0	8	62.4	8	56.3	8
	7	48.2	7	52.3	7	50.3	7
Bass Pro Dr/Domingue	6	41.5	6	41.3	6	40.9	6
Schriber Way	10	23.5	7	33.8	9	24.6	9
I-80 EB Ramps	7	31.1	5	46.1	7	35.1	5
I-80 EB On Ramp	36	4.0	34	4.7	36	4.0	36
I-80 WB On Ramp	37	1.3	35	1.8	37	1.3	37
I-80 WB Ramps	7	38.5	7	35.7	7	39.4	9
Granite Dr	6	48.3	6	46.1	6	50.9	7
Project Driveway	14	23.4	13	25.4	15	20.0	13
Dwy S of Brace Rd	16	9.7	13	13.6	17	9.6	11
Brace Rd	8	21.1	7	23.4	7	22.9	7
Taylor Rd	11	30.7	10	35.4	10	32.7	11
Total	9	453.9	9	503.2	9	467.8	9

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	65.6	100.2	0.4	16	16	67.0
Brace Rd	7	31.8	43.4	0.1	10	11	30.0
Dwy S of Brace Rd	21	18.0	23.3	0.1	9	8	22.3
	24	56.9	67.1	0.1	4	4	64.5
Granite Dr	8	121.1	132.1	0.1	4	3	126.4
I-80 WB Ramps	9	61.0	70.6	0.1	5	5	63.8
I-80 WB On Ramp	99	4.0	10.2	0.1	30	30	4.1
I-80 EB On Ramp	101	2.0	11.7	0.1	36	38	1.5
I-80 EB Ramps	10	62.1	261.8	0.1	6	6	59.7
	11	42.2	49.4	0.1	6	6	40.1
Bass Pro Dr/Domingue	12	49.8	57.3	0.1	5	5	48.7
	107	6.0	12.2	0.1	22	23	5.7
	80	2.0	10.2	0.1	39	39	2.0
Stadium Dwy	13	11.0	21.9	0.2	25	26	10.7
Total		533.5	871.5	1.7	9	9	546.5

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	21	41.3	15	69.6	12	98.7	19
Brace Rd	10	34.4	11	29.4	9	38.3	12
Dwy S of Brace Rd	7	24.0	11	13.2	7	26.4	22
	4	66.6	5	52.8	4	67.8	7
Granite Dr	3	126.9	4	115.3	3	125.5	4
I-80 WB Ramps	5	59.1	4	65.5	5	62.8	5
I-80 WB On Ramp	30	3.9	31	3.7	30	4.1	29
I-80 EB On Ramp	38	1.5	36	2.1	38	1.5	33
I-80 EB Ramps	6	56.9	6	65.0	6	60.8	5
	6	42.3	5	44.8	6	43.2	6
Bass Pro Dr/Domingue	5	49.2	5	48.9	5	49.5	5
	22	6.2	22	6.0	23	5.8	22
	39	2.0	39	2.1	40	1.9	39
Stadium Dwy	24	11.9	25	11.3	27	9.6	25
Total	9	526.2	9	529.8	9	595.8	10

Total Network Performance By Run

Run Number	1	2	3	4	5	Avg
Denied Delay (hr)	406.7	648.9	431.1	450.0	416.5	470.6
Denied Del/Veh (s)	105.6	168.4	112.4	116.7	110.3	122.8
Total Delay (hr)	572.7	625.7	584.7	625.2	550.6	591.8
Total Del/Veh (s)	153.0	173.8	156.2	167.8	149.4	160.0
Stop Del/Veh (s)	124.7	146.5	127.2	139.4	122.8	132.0
Stop/Veh	2.21	2.29	2.25	2.32	2.22	2.26
Travel Dist (mi)	7314.6	7067.2	7341.9	7275.9	7201.0	7240.1
Travel Time (hr)	1202.7	1489.9	1239.6	1297.1	1186.2	1283.1
Avg Speed (mph)	9	8	9	9	9	9
Vehicles Entered	12864	12421	12884	12858	12707	12743
Vehicles Exited	12551	12019	12551	12360	12329	12361
Hourly Exit Rate	12551	12019	12551	12360	12329	12361
Input Volume	67073	67073	67073	67073	67073	67073
% of Volume	19	18	19	18	18	18
Denied Entry Before	63	99	72	67	53	69
Denied Entry After	1000	1448	923	1026	885	1057

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Stadium Dwy	13	11.2	22.9	0.2	26	28	9.4
	80	33.0	44.3	0.2	13	10	45.5
	107	35.2	42.1	0.1	8	6	46.7
Bass Pro Dr/Domingue	12	28.3	64.0	0.1	10	9	30.8
Schriber Way	11	10.3	18.0	0.1	17	16	11.0
I-80 EB Ramps	10	39.4	45.9	0.1	6	6	38.2
I-80 EB On Ramp	101	4.1	12.5	0.1	34	35	3.8
I-80 WB On Ramp	99	1.7	12.0	0.1	35	33	2.4
I-80 WB Ramps	9	28.9	402.5	0.1	9	9	29.8
Granite Dr	8	37.7	45.5	0.1	7	7	36.1
Project Driveway	24	31.4	43.0	0.1	11	11	29.5
Dwy S of Brace Rd	21	5.1	12.2	0.1	23	24	4.8
Brace Rd	7	14.7	19.9	0.1	11	11	14.5
Taylor Rd	6	26.7	37.7	0.1	12	12	27.1
Total		307.7	822.5	1.5	12	12	329.7

Arterial Level of Service: NB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Stadium Dwy	34	6.1	22	15.4	20	18.9	35
	24	12.1	9	52.1	9	49.1	34
	12	21.3	7	46.0	7	43.7	14
Bass Pro Dr/Domingue	9	28.8	9	28.6	10	27.0	10
Schriber Way	15	11.8	17	10.2	18	9.3	18
I-80 EB Ramps	6	41.1	6	43.3	7	34.0	6
I-80 EB On Ramp	33	4.2	33	4.4	35	3.8	34
I-80 WB On Ramp	36	1.4	36	1.6	36	1.4	35
I-80 WB Ramps	8	33.3	8	31.0	10	26.4	10
Granite Dr	7	39.1	7	41.5	7	38.4	8
Project Driveway	12	27.7	10	35.0	10	34.6	11
Dwy S of Brace Rd	24	4.9	23	5.2	22	5.7	24
Brace Rd	11	13.5	11	14.4	10	16.8	11
Taylor Rd	11	28.7	12	25.8	13	25.3	12
Total	14	273.9	11	354.5	12	334.3	15

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Taylor Rd	6	35.2	82.8	0.6	27	27	33.8
Brace Rd	7	37.3	48.7	0.1	9	12	27.6
Dwy S of Brace Rd	21	36.8	42.3	0.1	5	5	37.2
	24	78.4	129.0	0.1	3	3	80.6
Granite Dr	8	128.1	138.6	0.1	3	3	123.6
I-80 WB Ramps	9	68.2	77.9	0.1	4	4	67.1
I-80 WB On Ramp	99	4.3	10.6	0.1	29	29	4.2
I-80 EB On Ramp	101	3.7	13.4	0.1	32	40	0.9
I-80 EB Ramps	10	77.9	215.8	0.1	5	7	48.7
	11	59.2	180.3	0.1	4	5	53.8
Bass Pro Dr/Domingue	12	67.2	74.4	0.1	4	5	55.9
	107	6.0	13.4	0.1	25	25	5.9
	80	0.9	8.0	0.1	43	43	0.9
Stadium Dwy	13	5.3	16.1	0.2	34	34	5.6
Total		608.5	1051.4	1.9	9	10	546.0

Arterial Level of Service: SB Sierra College Blvd

Cross Street	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Taylor Rd	24	43.4	28	31.0	26	36.3	28
Brace Rd	6	66.4	14	20.9	8	47.8	14
Dwy S of Brace Rd	4	47.9	6	29.0	4	44.0	7
	3	90.3	4	68.6	3	84.4	4
Granite Dr	3	141.1	4	116.0	3	136.6	3
I-80 WB Ramps	4	68.4	4	66.5	4	70.4	4
I-80 WB On Ramp	28	4.4	29	4.2	29	4.3	29
I-80 EB On Ramp	31	4.1	29	4.9	32	3.4	29
I-80 EB Ramps	4	98.0	5	80.0	5	72.4	4
	4	64.9	4	61.9	5	53.2	4
Bass Pro Dr/Domingue	5	58.7	3	79.5	4	62.7	4
	25	5.8	25	6.1	25	6.0	25
	44	0.8	42	1.2	43	0.9	43
Stadium Dwy	35	4.9	34	5.4	35	5.2	34
Total	8	699.3	9	575.4	9	627.7	9

Appendix E: Freeway Mainline Worksheets (HCS)

Existing Conditions

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3110	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	904	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1236	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1236	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.0	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4062	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1195	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1633	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1633	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.2	mi/h
Number of lanes, N	3	
Density, D	25.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3118	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	906	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1239	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1239	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3702	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1089	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1488	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1488	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.9	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4398	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1208	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1651	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1651	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.1	mi/h
Number of lanes, N	3	
Density, D	25.8	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3803	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1068	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4042	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1110	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1518	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1518	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	3	
Density, D	23.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3716	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1044	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1427	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1427	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.0	pc/mi/ln
Level of service, LOS	C	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3980	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1070	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1462	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1462	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3892	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1024	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1400	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1400	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3963	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1065	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1456	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1456	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	8/31/2017
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3812	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1003	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1371	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1371	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Existing Plus Project Conditions

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/2017
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3132	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	910	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1244	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1244	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/2017
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4085	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1201	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1642	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1642	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.2	mi/h
Number of lanes, N	3	
Density, D	25.6	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3125	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	908	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1242	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1242	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3709	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1091	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1491	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1491	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4469	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1228	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1678	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1678	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.9	mi/h
Number of lanes, N	3	
Density, D	26.3	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3870	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1087	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1486	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1486	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.9	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4061	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1116	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1525	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1525	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	3	
Density, D	23.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3736	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1049	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1434	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1434	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4110	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1105	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1510	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1510	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	3	
Density, D	23.3	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4029	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1060	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1449	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1449	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.3	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4002	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1076	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1470	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1470	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.9	mi/h
Number of lanes, N	3	
Density, D	22.6	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Existing Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3850	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1013	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1385	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1385	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.3	pc/mi/ln
Level of service, LOS	C	

Cumulative Conditions – Short Term Baseline

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3288	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	956	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1306	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1306	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	20.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4134	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1216	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1662	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1662	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.0	mi/h
Number of lanes, N	3	
Density, D	26.0-	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3216	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	935	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1278	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1278	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3923	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1154	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1577	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1577	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.6	mi/h
Number of lanes, N	3	
Density, D	24.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4564	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1327	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1813	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1813	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	3	
Density, D	29.0	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4068	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1196	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1635	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1635	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.2	mi/h
Number of lanes, N	3	
Density, D	25.5	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4419	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1285	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1756	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1756	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.2	mi/h
Number of lanes, N	3	
Density, D	27.8	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4016	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1181	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1614	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1614	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.4	mi/h
Number of lanes, N	3	
Density, D	25.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4187	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1126	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1538	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1538	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.7	mi/h
Number of lanes, N	3	
Density, D	23.8	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4243	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1117	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1526	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1526	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	3	
Density, D	23.6	pc/mi/ln
Level of service, LOS	C	

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Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4392	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1181	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1614	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1614	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.4	mi/h
Number of lanes, N	3	
Density, D	25.1	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/4/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4198	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1105	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1510	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1510	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	3	
Density, D	23.3	pc/mi/ln
Level of service, LOS	C	

Cumulative Conditions – Short Term Plus Project

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3310	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	962	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1315	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1315	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	20.2	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4157	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1223	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1671	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1671	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.0	mi/h
Number of lanes, N	3	
Density, D	26.1	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3223	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	937	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1280	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1280	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	3930	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1156	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1580	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1580	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.5	pc/mi/ln
Level of service, LOS	C	

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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4635	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1347	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1841	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1841	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.2	mi/h
Number of lanes, N	3	
Density, D	29.6	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4135	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1216	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1662	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1662	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.0	mi/h
Number of lanes, N	3	
Density, D	26.0-	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4438	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1290	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1763	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1763	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.1	mi/h
Number of lanes, N	3	
Density, D	27.9	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4036	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1187	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1622	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1622	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.3	mi/h
Number of lanes, N	3	
Density, D	25.2	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4317	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1160	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1586	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1586	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.6	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4380	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1153	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1575	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1575	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.6	mi/h
Number of lanes, N	3	
Density, D	24.4	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4431	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1191	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1628	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1628	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.3	mi/h
Number of lanes, N	3	
Density, D	25.3	pc/mi/ln
Level of service, LOS	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Short Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4236	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1115	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	3	
Density, D	23.5	pc/mi/ln
Level of service, LOS	C	

Cumulative Conditions – Long Term Baseline

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Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4780	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1390	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1899	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1899	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.5	mi/h
Number of lanes, N	3	
Density, D	30.9	pc/mi/ln
Level of service, LOS	D	

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Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/818
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4700	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1382	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1889	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1889	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.6	mi/h
Number of lanes, N	3	
Density, D	30.7	pc/mi/ln
Level of service, LOS	D	

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Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5000	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1453	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1986	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1986	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.1	mi/h
Number of lanes, N	3	
Density, D	33.0	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4290	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1262	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1724	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1724	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.5	mi/h
Number of lanes, N	3	
Density, D	27.1	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5060	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1390	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1900	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1900	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.5	mi/h
Number of lanes, N	3	
Density, D	30.9	pc/mi/ln
Level of service, LOS	D	

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Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5440	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1528	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	2088	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2088	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	58.3	mi/h
Number of lanes, N	3	
Density, D	35.8	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4440	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1220	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1667	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1667	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.0	mi/h
Number of lanes, N	3	
Density, D	26.1	pc/mi/ln
Level of service, LOS	D	

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Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5550	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1559	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	2131	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2131	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.4	mi/h
Number of lanes, N	3	
Density, D	37.1	pc/mi/ln
Level of service, LOS	E	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5340	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1435	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1962	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1962	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.5	mi/h
Number of lanes, N	3	
Density, D	32.4	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5030	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1324	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1809	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1809	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	3	
Density, D	28.9	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5350	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1438	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1966	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1966	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.5	mi/h
Number of lanes, N	3	
Density, D	32.5	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5050	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1329	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1816	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1816	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	3	
Density, D	29.0	pc/mi/ln
Level of service, LOS	D	

Cumulative Conditions – Long Term Plus Project

Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4802	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1396	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1908	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1908	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.3	mi/h
Number of lanes, N	3	
Density, D	31.1	pc/mi/ln
Level of service, LOS	D	

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Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4723	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1389	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1898	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1898	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.5	mi/h
Number of lanes, N	3	
Density, D	30.9	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5007	veh/h
Peak-hour factor, PHF	0.86	
Peak 15-min volume, v15	1456	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1989	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1989	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.1	mi/h
Number of lanes, N	3	
Density, D	33.1	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
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Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	AM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4297	veh/h
Peak-hour factor, PHF	0.85	
Peak 15-min volume, v15	1264	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1727	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1727	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.5	mi/h
Number of lanes, N	3	
Density, D	27.2	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5131	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1410	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1926	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1926	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.1	mi/h
Number of lanes, N	3	
Density, D	31.5	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5507	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1547	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	2114	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2114	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.8	mi/h
Number of lanes, N	3	
Density, D	36.6	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	4459	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1225	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1674	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1674	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.9	mi/h
Number of lanes, N	3	
Density, D	26.2	pc/mi/ln
Level of service, LOS	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	PM
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5570	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1565	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	2138	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2138	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.3	mi/h
Number of lanes, N	3	
Density, D	37.3	pc/mi/ln
Level of service, LOS	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5470	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1470	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	2010	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	2010	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	59.7	mi/h
Number of lanes, N	3	
Density, D	33.7	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	East of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5167	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1360	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1858	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1858	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.0	mi/h
Number of lanes, N	3	
Density, D	30.0	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 EB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5389	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1449	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1980	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1980	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.2	mi/h
Number of lanes, N	3	
Density, D	32.9	pc/mi/ln
Level of service, LOS	D	

HCS 2010: Basic Freeway Segments Release 6.80

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	HXA
Agency or Company:	KAI
Date Performed:	12/3/18
Analysis Time Period:	MD
Freeway/Direction:	I-80 WB
From/To:	West of Sierra College Blvd.
Jurisdiction:	Caltrans
Analysis Year:	Long Term Plus Project
Description:	20345 Loomis Costco

Flow Inputs and Adjustments

Volume, V	5088	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1339	v
Trucks and buses	5	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.976	
Driver population factor, fp	1.00	
Flow rate, vp	1830	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1830	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.4	mi/h
Number of lanes, N	3	
Density, D	29.3	pc/mi/ln
Level of service, LOS	D	

Appendix F: Costco Trip Data

COSTCO TRIP GENERATION DATABASE

Trip generation studies were conducted at Costco Wholesale sites located across the western region of the United States using industry standard engineering practices consistent with guidance within the Institute of Transportation Engineers (ITE) standard reference, *Trip Generation Handbook, 9th Edition Volume 1*. These cordon surveys were conducted between 2001 and 2010, and include 22 surveys of Costco Warehouses with fuel centers in California, Oregon, Washington, Montana, Utah, and Colorado.

The Costco Wholesale buildings surveyed range in size between 120,000 square feet and 162,115 square feet, with an average size of 143,782 square feet and had Costco Gasoline fuel centers. As a result, the Costco Wholesale trip generation rates inherently account for Costco Gasoline fuel center trips within the overall rate. Table 1 summarizes the average trip rates recorded.

Table 1: Average Trip Characteristics for a Costco Warehouse with Fuel Center

Land Use	Weekday Daily Trip Rate (per KSF)	Weekday PM Peak Hour of Adjacent Street Traffic Trip Rate (per KSF)			Weekend Midday Peak Hour (per KSF)		
		Total	In	Out	Total	In	Out
Costco Warehouse With Fuel Center	79.27	7.17	48.5%	51.5%	9.79	51%	49%
Primary Trips	No Data		35.1%			50%	
Pass-by Trips	No Data		33.3%			29%	
Diverted Trips	No Data		31.5%			21%	

Source: Kittelson & Associates, Inc. 2018

COMPARISON TO NATIONAL DATA

Trip data for member-based retail establishments is available through the *Trip Generation Manual* published by ITE. Both the 9th Edition (published in 2012) and the 10th Edition (published in 2017) of the document include Land Use 857, Discount Club (the daily, weekday PM peak hour, and Saturday peak hour data by building size is identical in both editions). Discount Club is defined in the *Trip Generation Manual* as follows "A discount club is a discount store or warehouse where shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items such as food, clothing, tires and appliance; many items are sold in large quantities or bulk. Some sites may include on-site fueling pumps." The *Trip Generation Manual* Discount Club definition clearly conveys a land use comparable to a Costco Wholesale.

Table 2 compares the trip rates for Discount Club[1] and the Costco Rates while Table 3 compares the trip type data for the two uses. As shown in the two tables, use of the Costco data results in a higher trip rate per square foot and a lower pass-by percentage compared to use of Discount Club data from the *Trip Generation Manual.* Kittelson & Associates uses the Costco-specific data in lieu of traditional

[1] Discount Club trip type data obtained from Tables E.18 and E.19 in the *Trip Generation Handbook, 3rd Edition* published by ITE in September 2017.

Trip Generation Manual to provide both Costco and the impacted review agencies with data that is representative of potential site development impacts.

Table 2: Trip Rate Comparison

Land Use	Weekday Daily Trip Rate	Weekday PM Peak Hour of Adjacent Street Traffic Trip Rate			Weekend Midday Peak Hour of Generator Trip Rate		
		Total	In	Out	Total	In	Out
Costco	79.27	7.17	48.5%	51.5%	9.79	51%	49%
Discount Club	41.8	4.18	50%	50%	6.37	49%	51%
Difference*	37.47	2.99			3.42		

*Costco trip rate – Discount Club trip rate
Source: Kittelson & Associates, Inc. 2019

Table 3: Trip Type Comparison

Land Use	Weekday PM Peak Hour			Weekend Midday Peak Hour		
	Primary Trips	Pass-by Trips	Diverted Trips	Primary Trips	Pass-by Trips	Diverted Trips
Costco	35%	33%	32%	50%	29%	21%
Discount Club	No data	37%	No data	No data	30%	No data
Difference*		-4%			-1%	

*Costco trip rate – Discount Club trip rate
Source: Kittelson & Associates, Inc. 2019

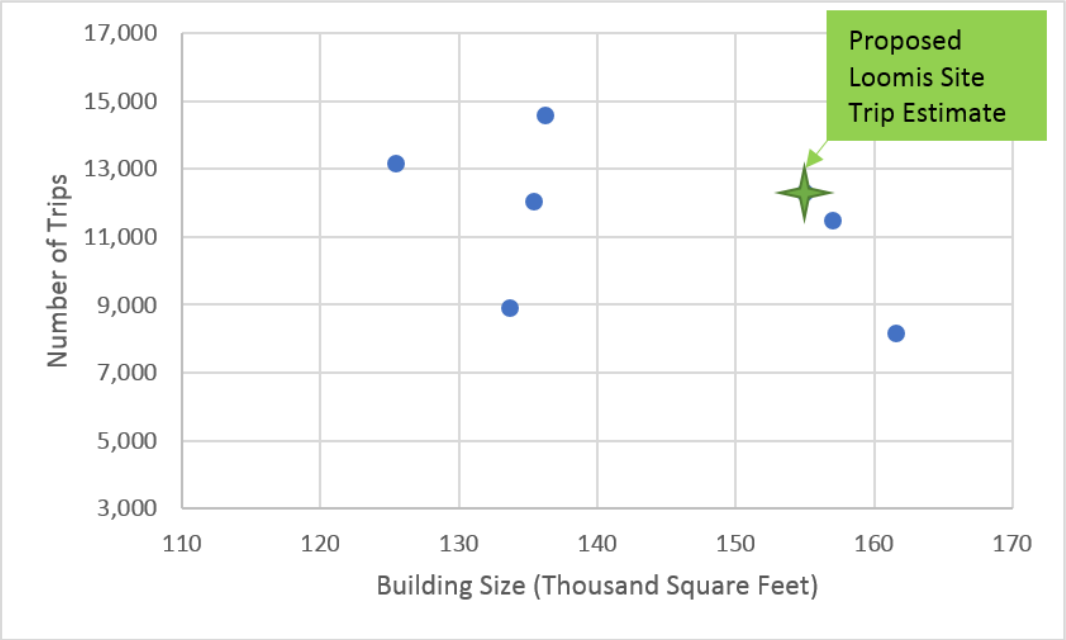
SUPPLEMENTAL COSTCO TRIP DATA

Data supporting the trip rates shown in Table 1 is summarized in further detail below in a graphical format similar to the data presented in *Trip Generation Manual, 9th Edition*.

Daily Trip Data

Daily trip data is available for six sites as shown in Exhibit 1, along with a data point representing the trip estimate for the proposed Loomis site. Following the data plot format used in the *Trip Generation Manual*, Exhibit 1 illustrates that the daily trip estimate for proposed Loomis Costco is supported by the trip rate data, reflecting an average trip rate amongst the sites surveyed.

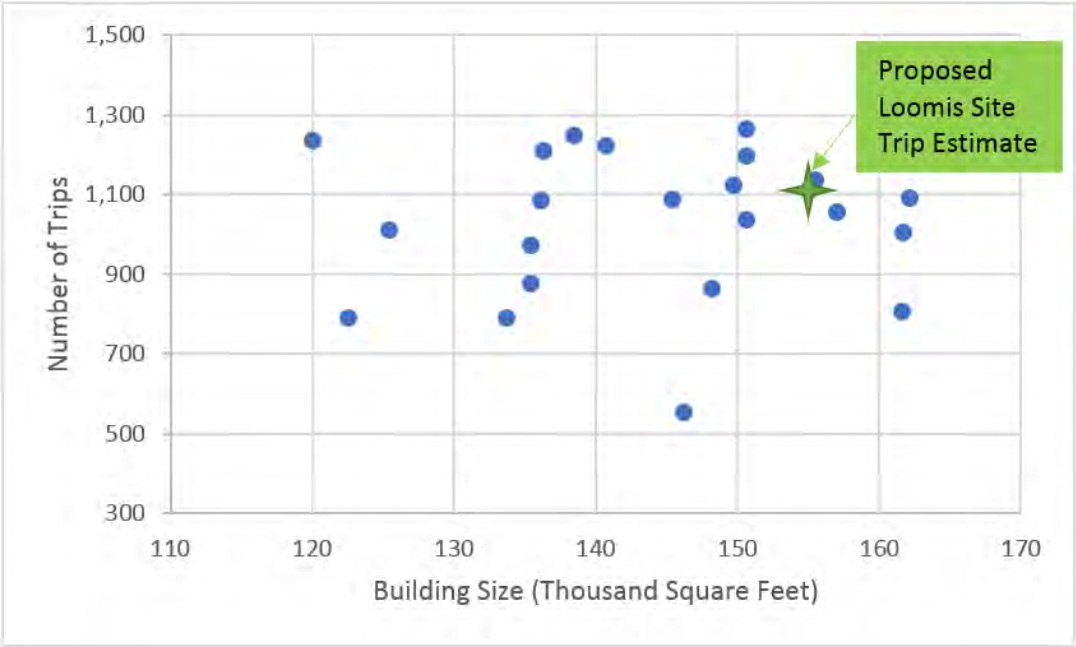
Exhibit 1. Costco Daily Trip Data



Weekday PM Peak Hour Trip Data

Weekday PM peak hour trip data is available for 19 sites (including 3 studies of one site) as shown in Exhibit 2. Exhibit 2 illustrates that the weekday PM peak hour trip estimate for proposed Loomis Costco is supported by the trip data, reflecting an average trip rate amongst the sites surveyed.

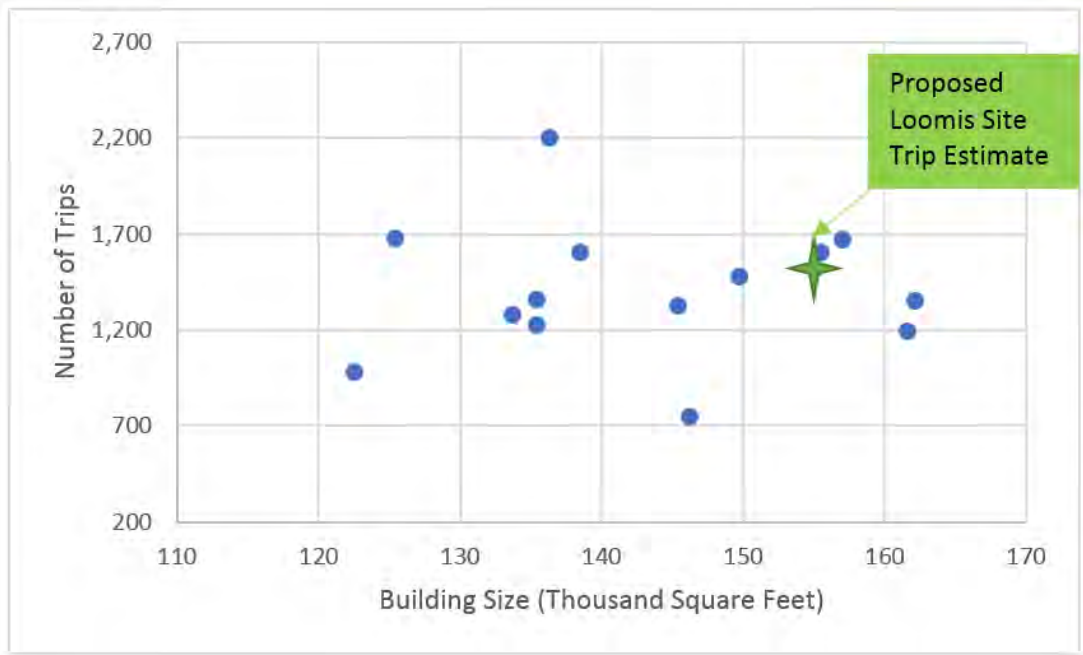
Exhibit 2. Costco PM Peak Hour Trip Data



Saturday Peak Hour Trip Data

Saturday Peak Hour trip data is available for 14 sites as shown in Exhibit 3. Exhibit 3 illustrates that the Saturday midday trip estimate for proposed Loomis Costco is supported by the trip rate data, reflecting an average trip rate amongst the sites surveyed.

Exhibit 3. Costco Saturday Midday Peak Hour Trip Data



Loomis Costco Site

Zip Code	City Name	Total Members Anticipated at Site	New Members Anticipated at Site	Average Trip Length (miles)
95602	AUBURN	3653	352	17
95603	AUBURN	5920	668	11
95614	COOL	932	58	20
95631	FORESTHILL	1140	96	32
95635	GREENWOOD	210	12	24
95650	LOOMIS	3277	433	2
95701	ALTA	69	8	43
95703	APPLEGATE	371	40	20
95713	COLFAX	1698	164	30
95714	DUTCH FLAT	0	0	37
95715	EMIGRANT GAP	18	4	54
95717	GOLD RUN	1	0	35
95722	MEADOW VISTA	1215	132	19
95910	ALLEGHANY	5	2	74
95919	BROWNSVILLE	91	4	71
95922	CAMPTONVILLE	151	13	64
95925	CHALLENGE	35	2	77
95935	DOBBINS	52	3	70
95945	GRASS VALLEY	4229	432	34
95946	PENN VALLEY	1916	166	41
95959	NEVADA CITY	3382	328	46
95960	NORTH SAN JUAN	73	2	52
95962	OREGON HOUSE	122	4	65
95972	RACKERBY	0	0	0
95975	ROUGH AND READY	237	17	39
95986	WASHINGTON	7	0	58
95633	GARDEN VALLEY	624	42	31
95664	PILOT HILL	332	26	25
95944	GOODYEARS BAR	1	0	70
95930	CLIPPER MILLS	29	1	80
95918	BROWNS VALLEY	213	10	56
95651	LOTUS	167	16	26
95634	GEORGETOWN	534	49	37
95746	GRANITE BAY	5335	536	6
95658	NEWCASTLE	1337	144	9
95613	COLOMA	0	0	0
95949	GRASS VALLEY	3145	274	26
95941	FORBESTOWN	15	2	76
95977	SMARTSVILLE	107	8	48
95663	PENRYN	551	68	4
95677	ROCKLIN	3701	344	2
95936	DOWNIEVILLE	30	4	88
96125	SIERRA CITY	27	3	95
95981	STRAWBERRY VALLEY	4	1	91
95914	BANGOR	48	3	64
96161	TRUCKEE	1113	127	77
95728	SODA SPRINGS	1	0	63
96126	SIERRAVILLE	0	0	106
95762	EL DORADO HILLS	1012	87	20
95672	RESCUE	82	7	31
95667	PLACERVILLE	476	44	37
95901	MARYSVILLE	67	4	46
95966	OROVILLE	247	21	70
95648	LINCOLN	193	14	13
96146	OLYMPIC VALLEY	5	1	87
95661	ROSEVILLE	17	2	6
95765	ROCKLIN	20	1	2

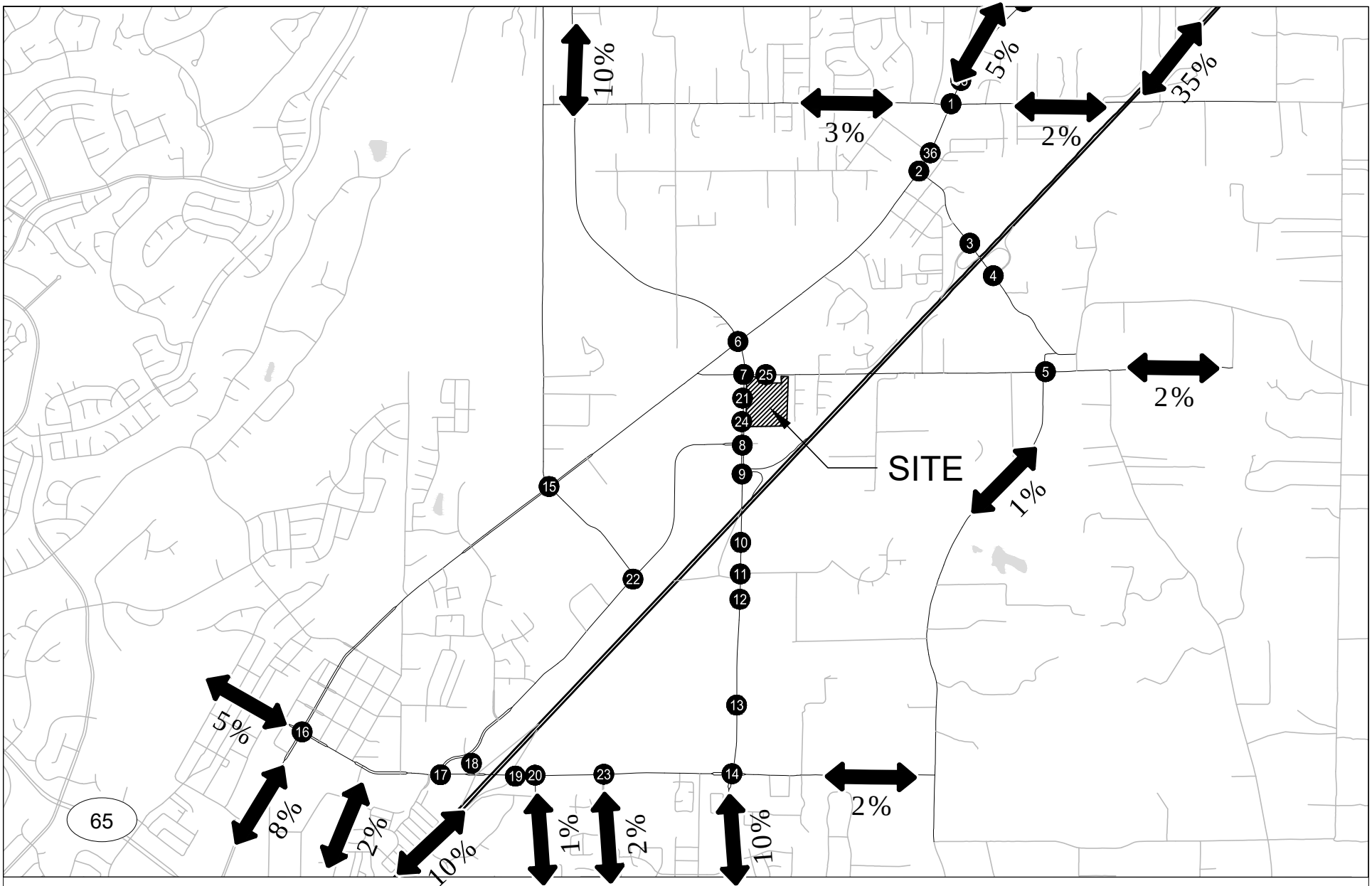
Roseville Costco Site

Zip Code	City Name	Total Members Anticipated at Site	New Members Anticipated at Site	Average Trip Length (miles)
95681	SHERIDAN	169	18	19
95747	ROSEVILLE	15062	968	7
95678	ROSEVILLE	8322	716	2
95765	ROCKLIN	8874	615	3
95674	RIO OSO	101	8	22
95648	LINCOLN	12400	897	12
95692	WHEATLAND	470	42	23
95661	ROSEVILLE	5387	549	4
95668	PLEASANT GROVE	87	9	16
95626	ELVERTA	466	40	18
95677	ROCKLIN	2378	221	2
95663	PENRYN	198	24	9
95949	GRASS VALLEY	835	73	31
95658	NEWCASTLE	252	27	13
95659	NICOLAUS	14	1	21
95903	BEALE AFB	24	0	29
95746	GRANITE BAY	753	76	7
95961	OLIVEHURST	30	1	35
95977	SMARTSVILLE	2	0	50
95991	YUBA CITY	12	1	43
95843	ANTELOPE	53	2	10
95621	CITRUS HEIGHTS	58	4	7
95901	MARYSVILLE	5	0	42

Total Members	**104,187**
Total New Members	**9,070**
% New Members	**8.7%**
Total Members North of Loomis	**33,113**
Weighted Average Trip Length - Loomis	**22**
Weighted Average Trip Length - Roseville	**7**

Appendix G: Regional Trip Distribution, Trip Assignment, Percent Project Trips

Regional Trip Distribution



- Study Intersections

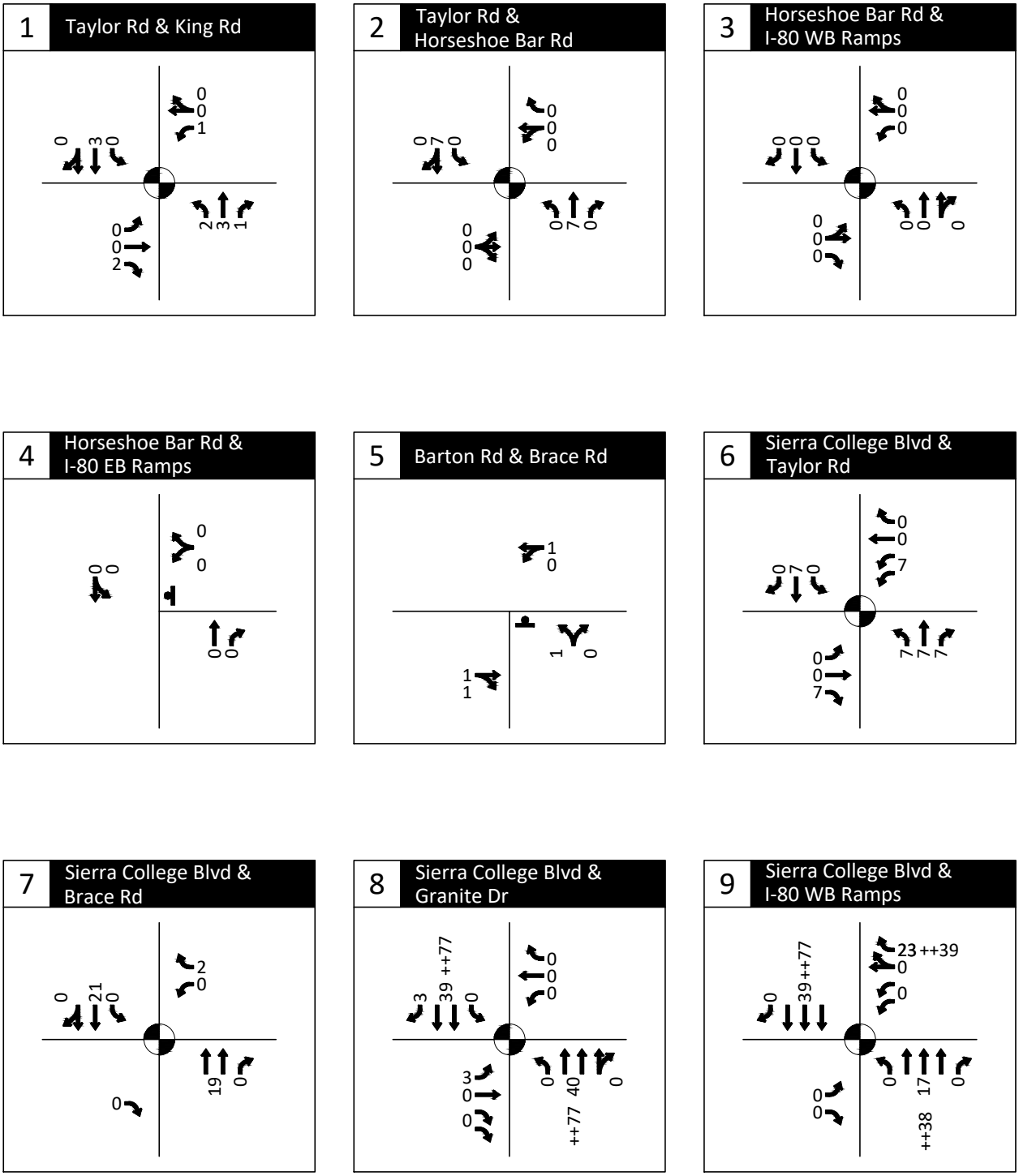
Regional Distribution
Loomis, California

Figure
G-1

KITTELSON & ASSOCIATES

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20180131.dwg Dec 14, 2018 - 8:10am - lnuxoll Layout Tab: TD Gen A

Project Trip Assignment – With Pass-by and Diverting Trips



- Weekday AM Traffic Volume
- Stop Sign
- Traffic Signal

+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday AM Peak Hour
Loomis, California

Figure
G2-A

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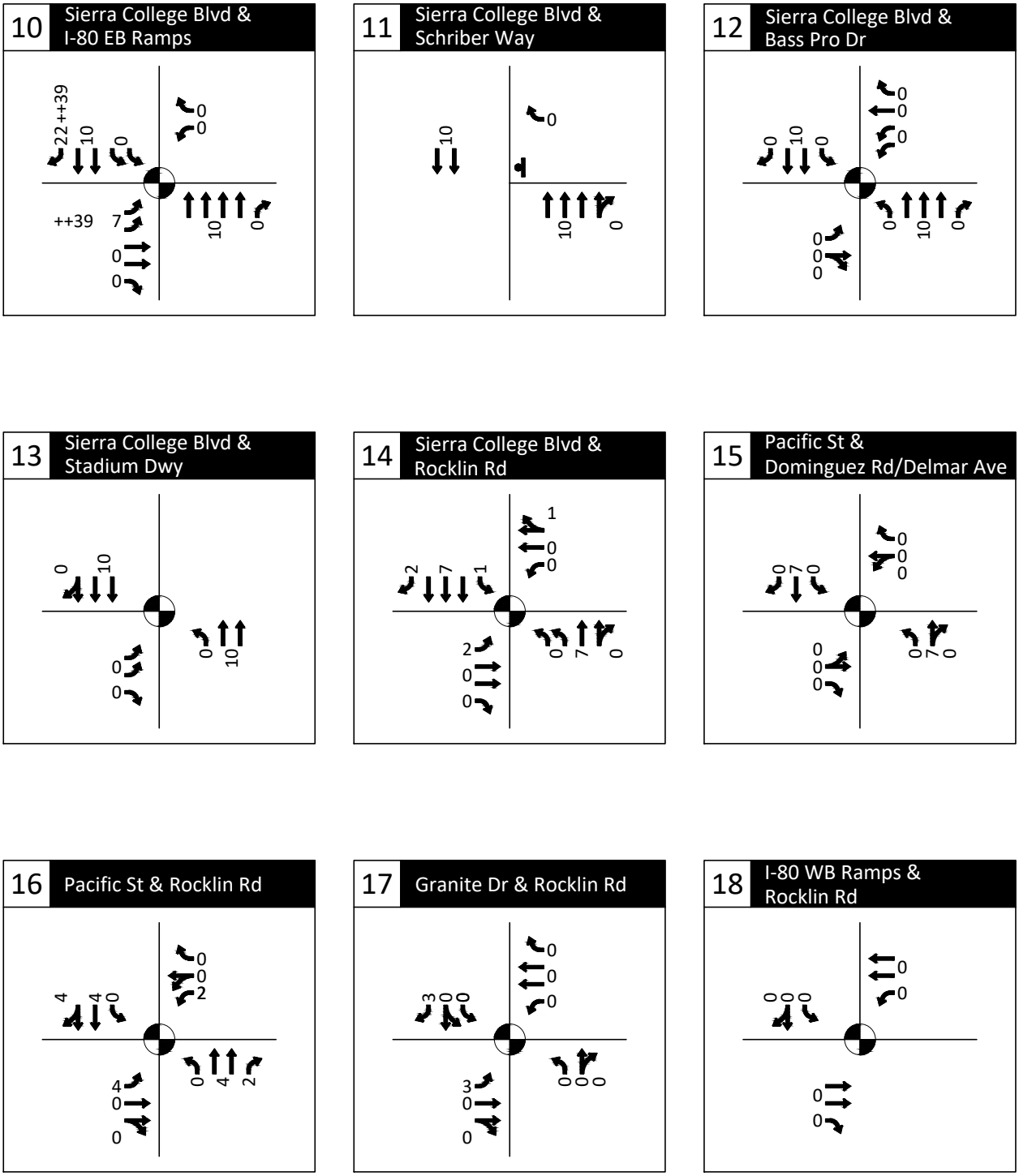

- Weekday AM Traffic Volume
- Stop Sign
- Traffic Signal

+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday AM Peak Hour
Loomis, California

Figure
G2-B

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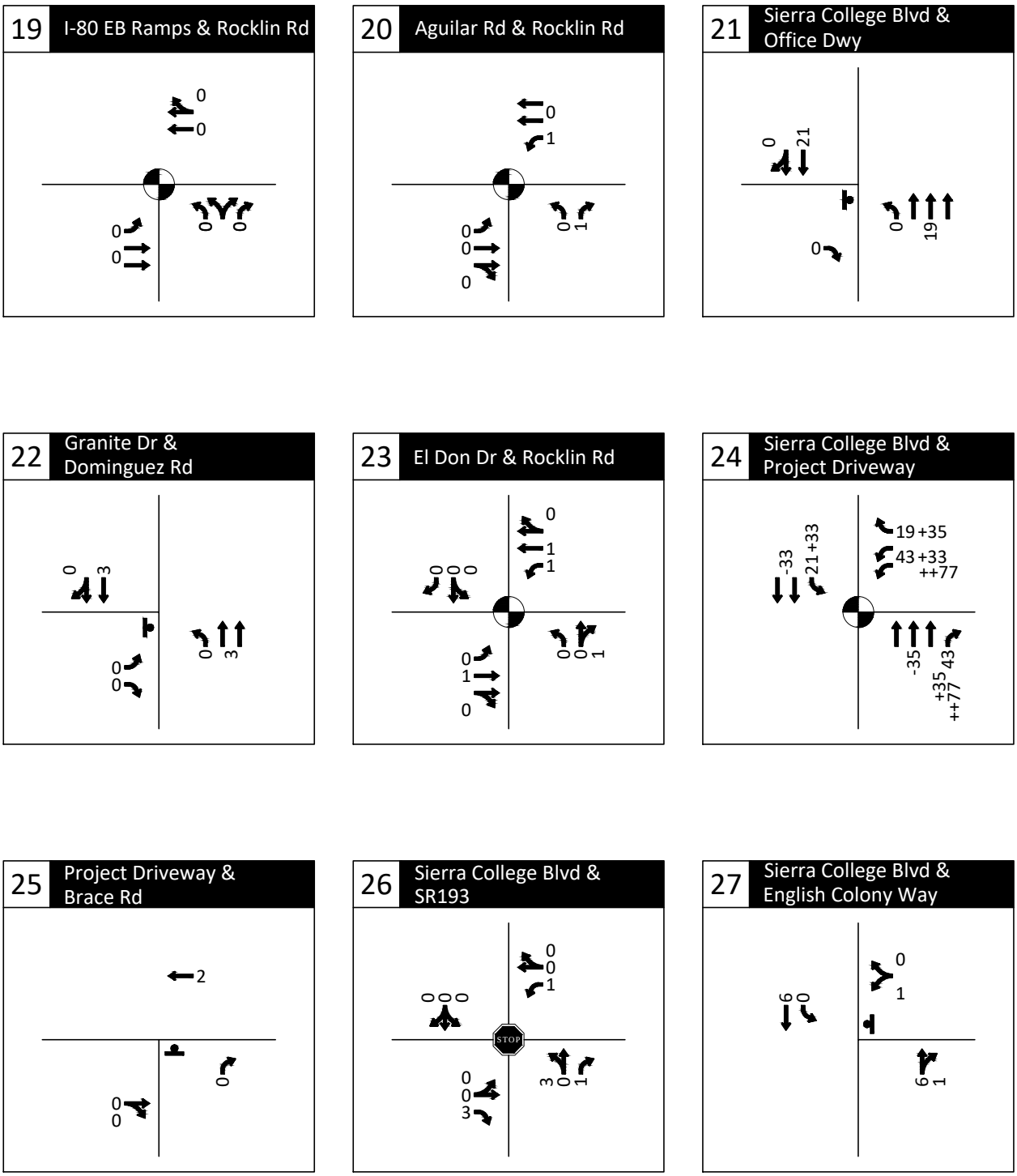

- Weekday AM Traffic Volume
- Stop Sign
- Traffic Signal

+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday AM Peak Hour
Loomis, California

Figure
G2-C

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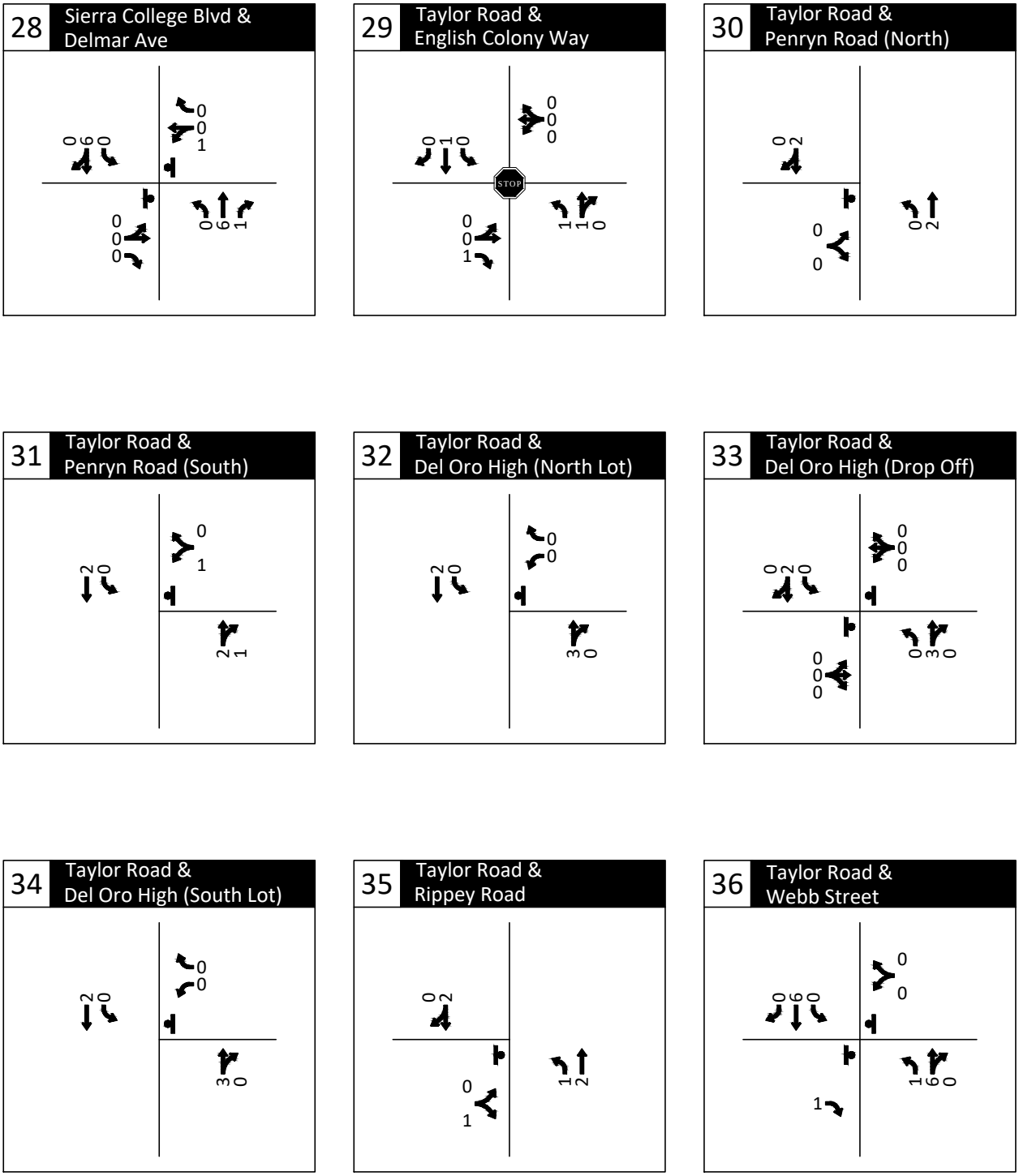

- Weekday AM Traffic Volume
- Stop Sign
- Traffic Signal

+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday AM Peak Hour
Loomis, California

Figure
G2-D

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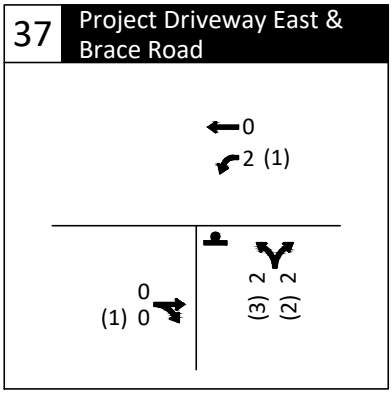

- Weekday AM Traffic Volume
- Stop Sign
- Traffic Signal
+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday AM Peak Hour
Loomis, California

Figure
G2-E

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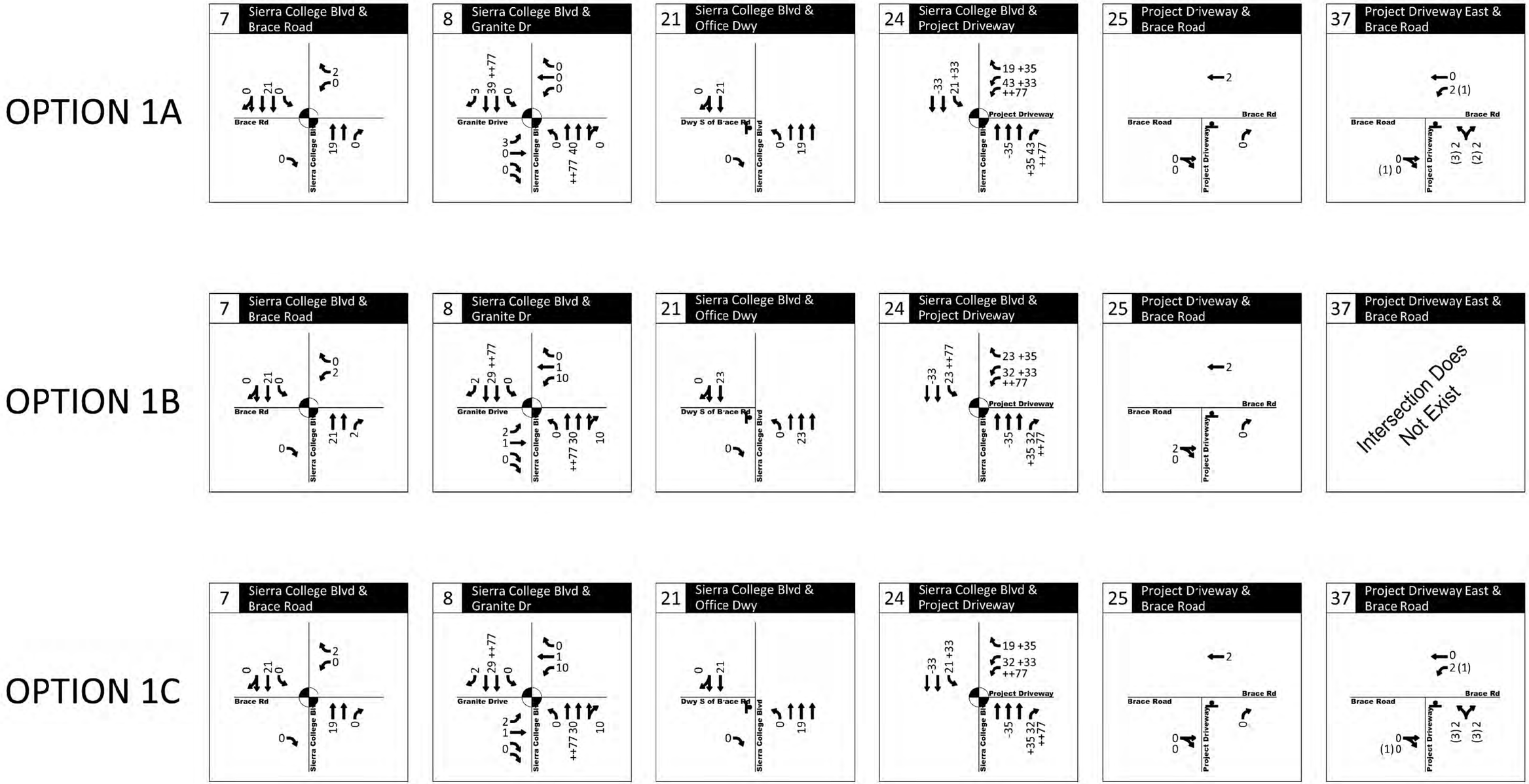


- Weekday AM Traffic Volume
- Stop Sign
- Traffic Signal

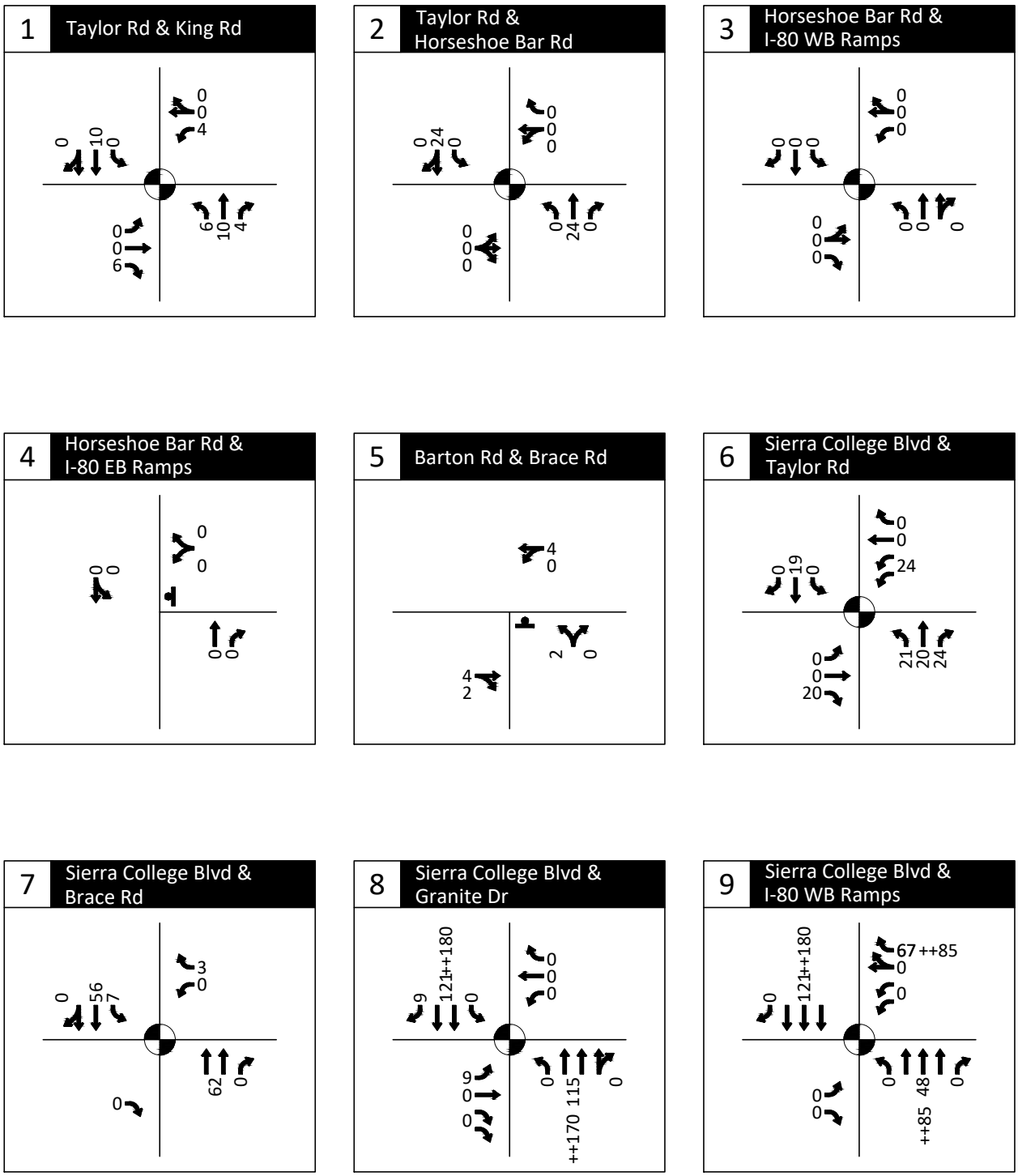
+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Driveway Options Trip Assignment
Weekday AM Peak Hour
Loomis, California

Figure G2-F

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:38pm - aloveday Layout Tab: AM_PO_PB_DT

KITTELSON & ASSOCIATES



- Weekday PM Traffic Volume +## - Pass by Trips

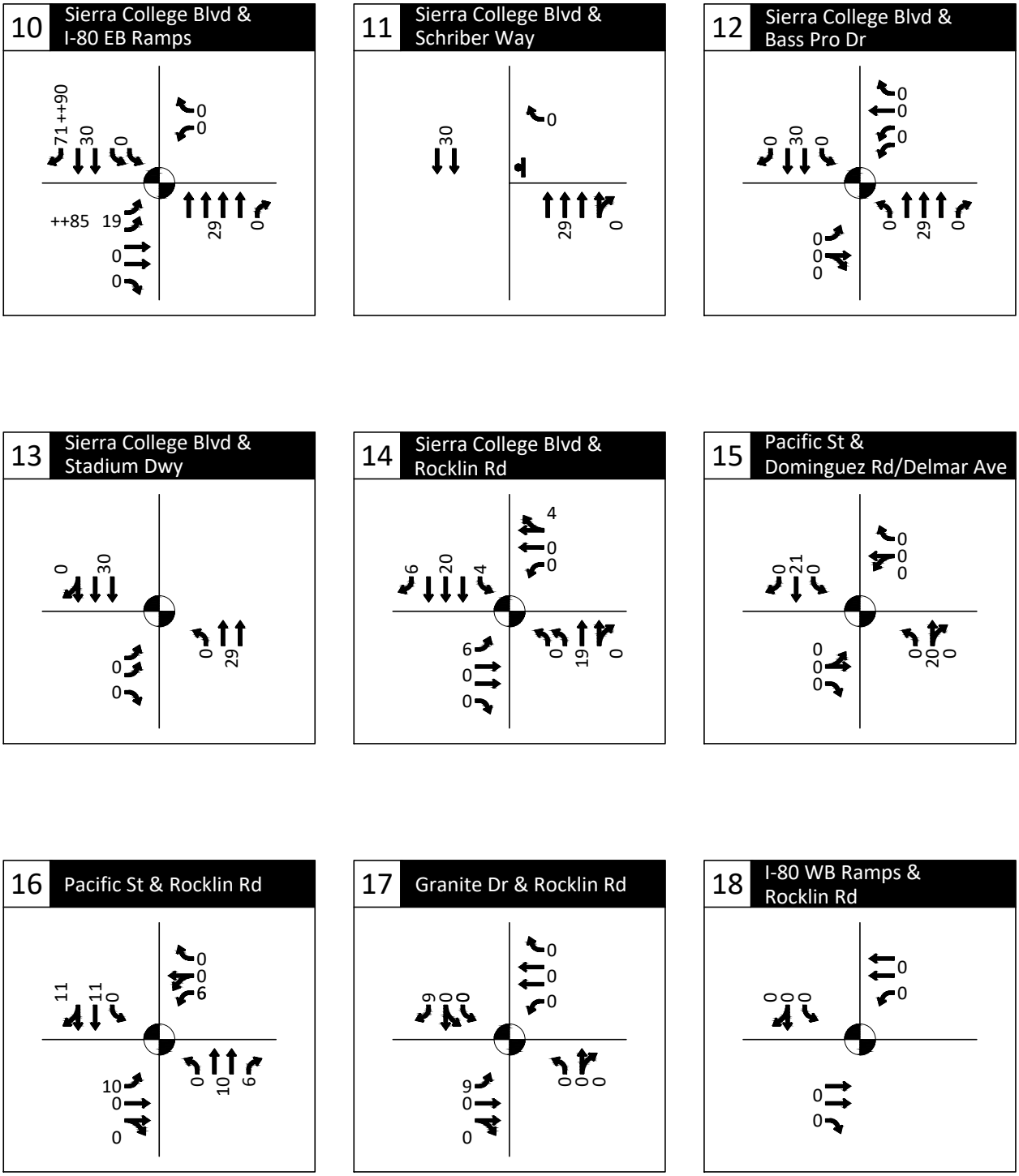
- Stop Sign ++## - Diverted Trips

- Traffic Signal (##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday PM Peak Hour
Loomis, California

Figure
G3-A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:46pm - aloveday Layout Tab: PM_PO_PB_DT-A



- Weekday PM Traffic Volume +## - Pass by Trips

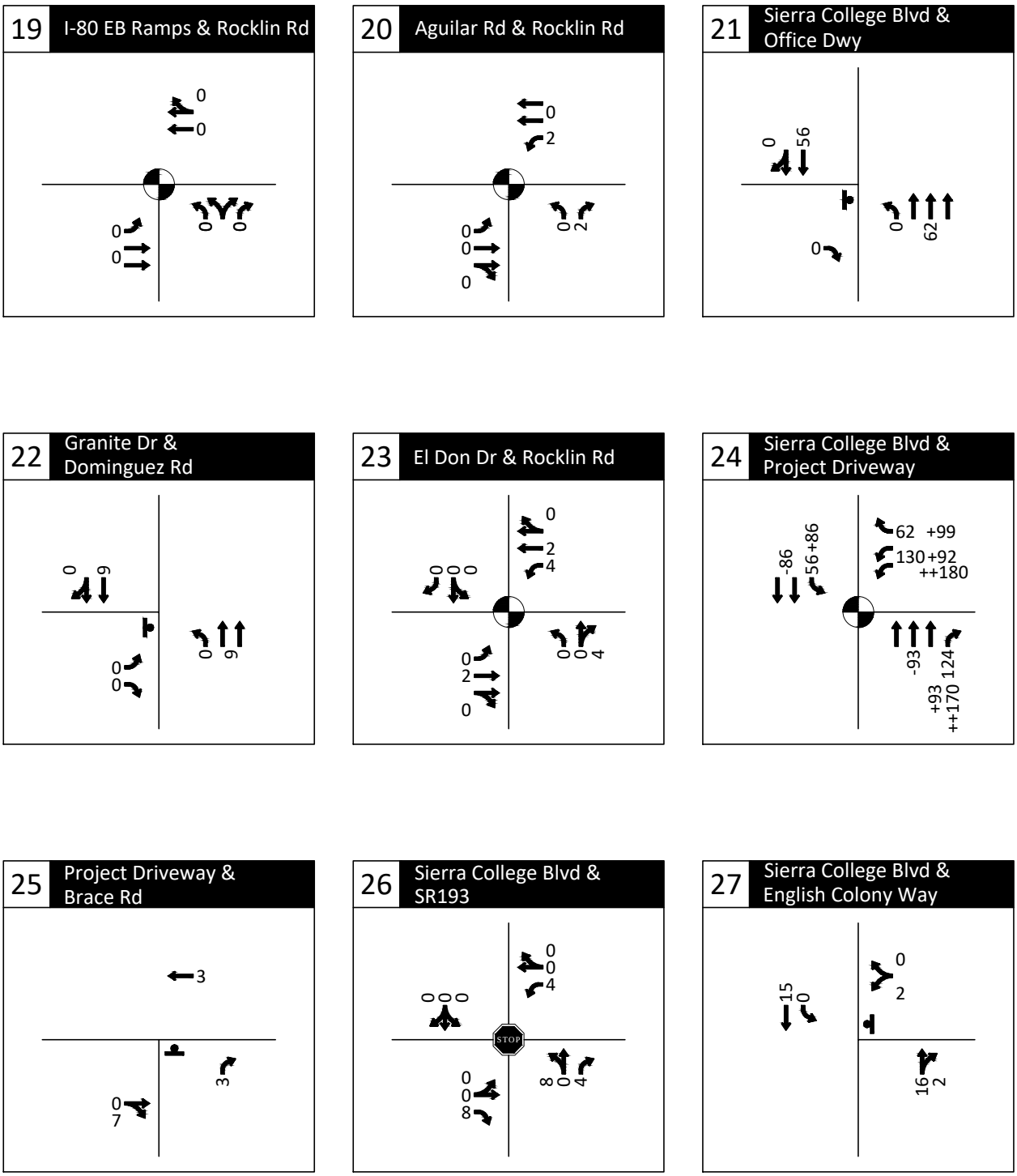
- Stop Sign ++## - Diverted Trips

- Traffic Signal (##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday PM Peak Hour
Loomis, California

Figure
G3-B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:47pm - aloveday Layout Tab: PM_PO_PB_DT-B



- Weekday PM Traffic Volume +## - Pass by Trips

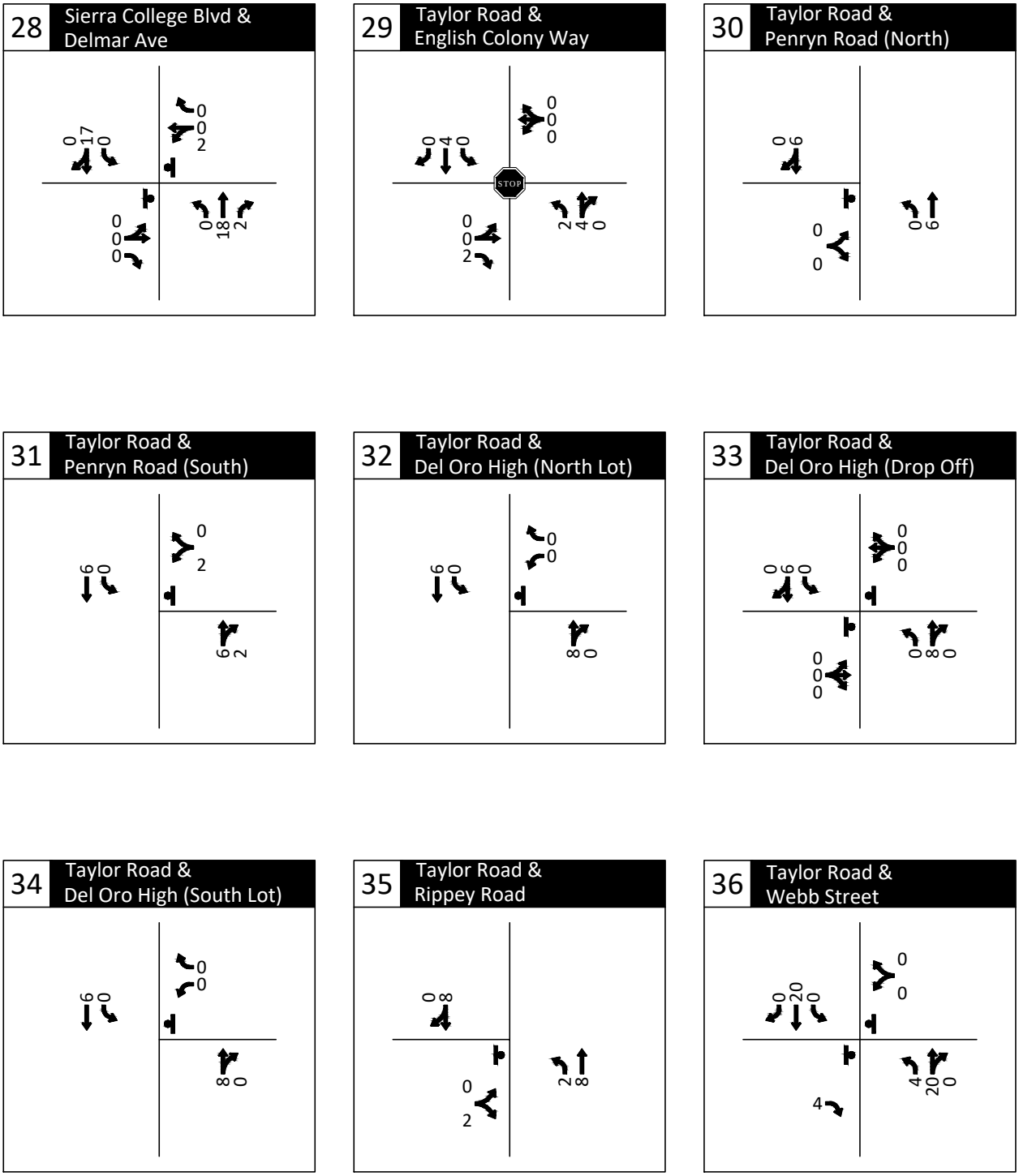
- Stop Sign ++## - Diverted Trips

- Traffic Signal (##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday PM Peak Hour
Loomis, California

Figure
G3-C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:47pm - aloveday Layout Tab: PM_PO_PB_DT-C



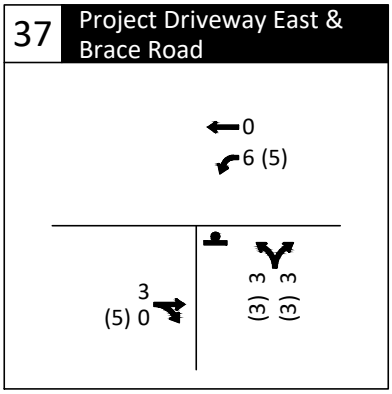
- Weekday PM Traffic Volume
- Stop Sign
- Traffic Signal

+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday PM Peak Hour
Loomis, California

Figure
G3-D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:47pm - aloveday Layout Tab: PM_PO_PB_DT-D

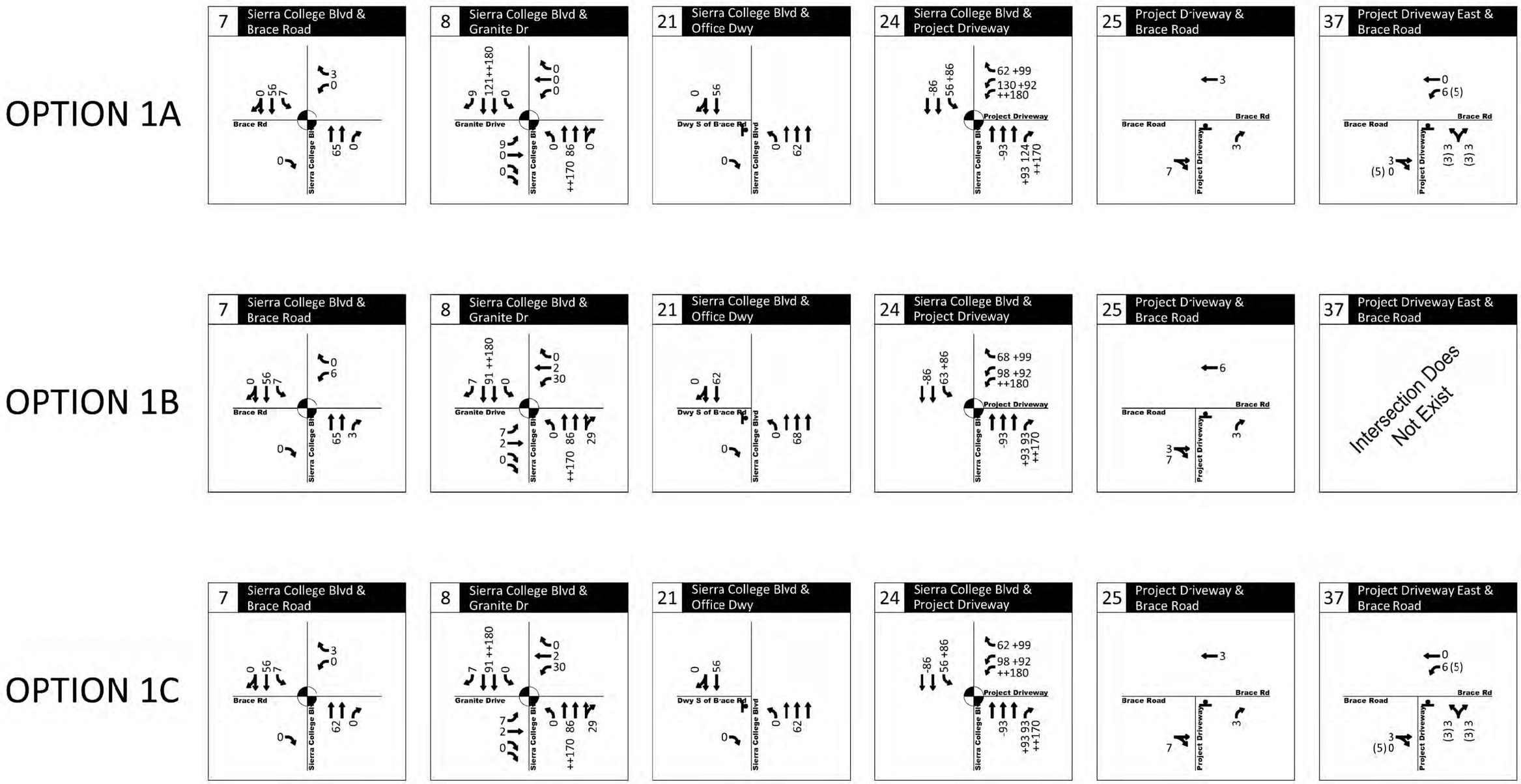


- Weekday PM Traffic Volume
+## - Pass by Trips
- Stop Sign
++## - Diverted Trips
- Traffic Signal
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekday PM Peak Hour
Loomis, California

Figure
G3-E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:48pm - aloveday Layout Tab: PM_PO_PB_DT-E



- Weekday PM Traffic Volume
- Stop Sign
- Traffic Signal

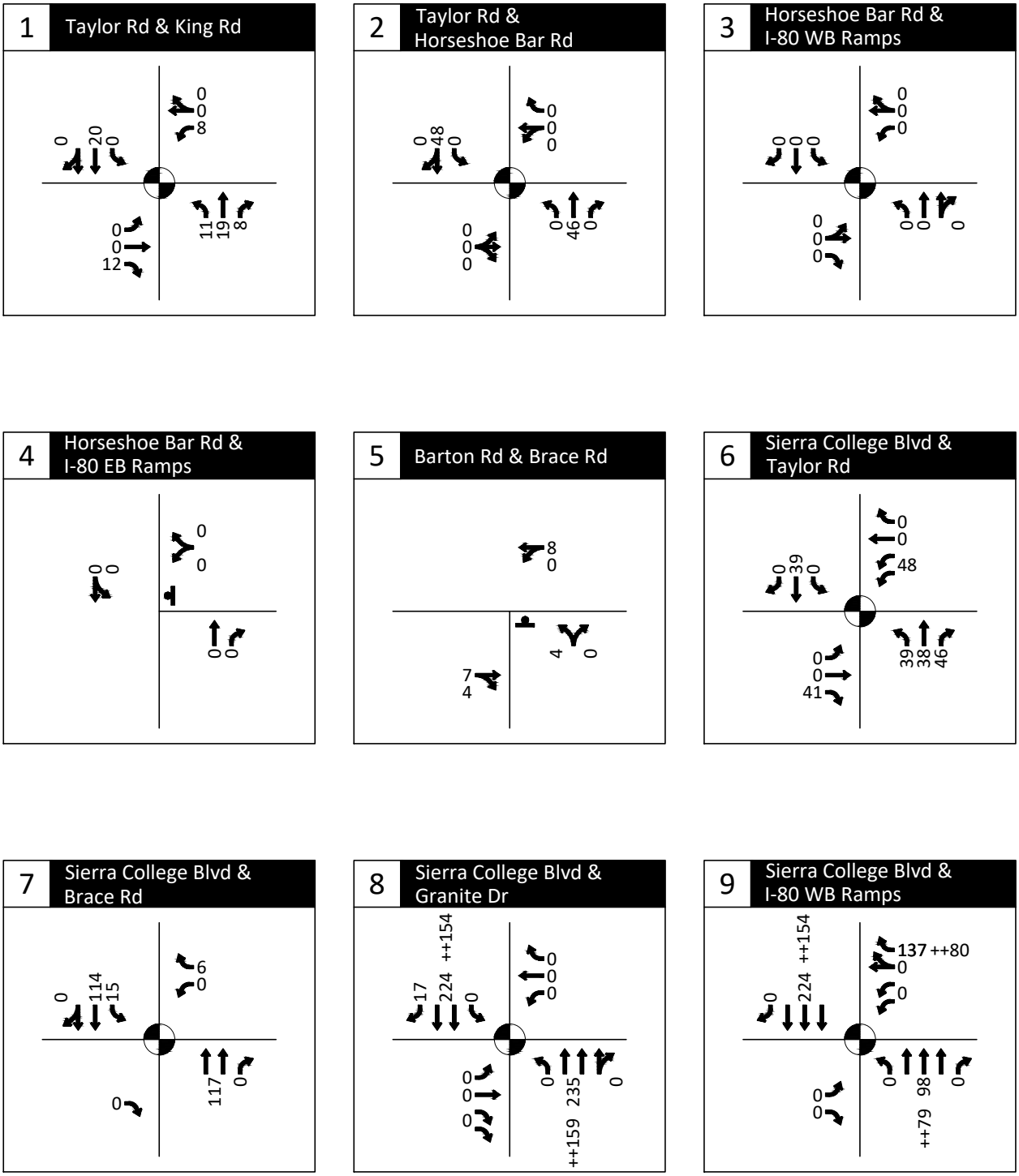
+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Driveway Options Trip Assignment
Weekday PM Peak Hour
Loomis, California

Figure G3-F

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:39pm - aloveday Layout Tab: PM_PO_PB_DT

KITTELSON & ASSOCIATES

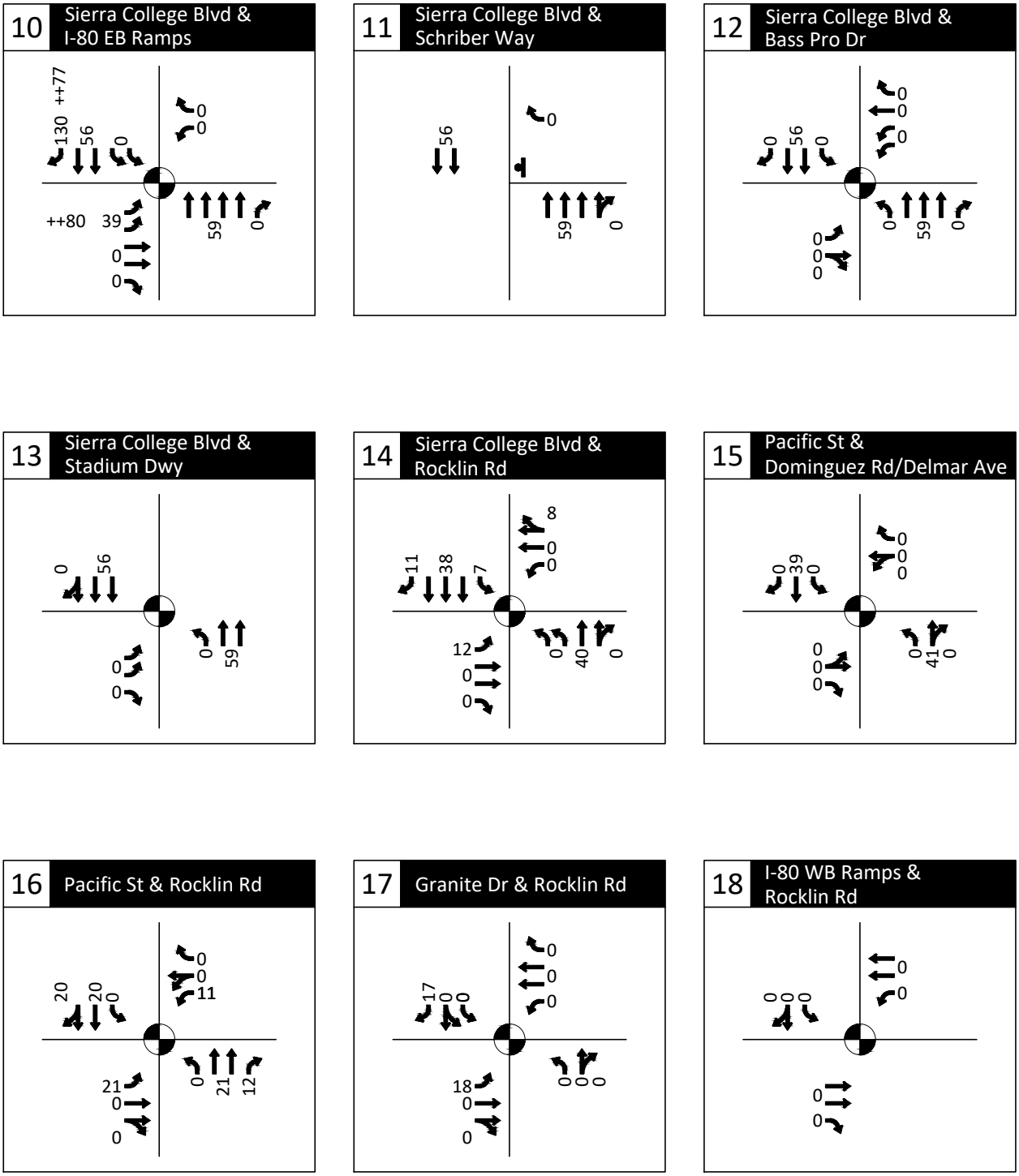


- Weekend Midday Traffic Volume
+## - Pass by Trips
- Stop Sign
++## - Diverted Trips
- Traffic Signal
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekend Midday Peak Hour
Loomis, California

Figure
G4-A

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:48pm - aloveday Layout Tab: SAT_PO_PB_DT-A



- Weekend Midday Traffic Volume +## - Pass by Trips

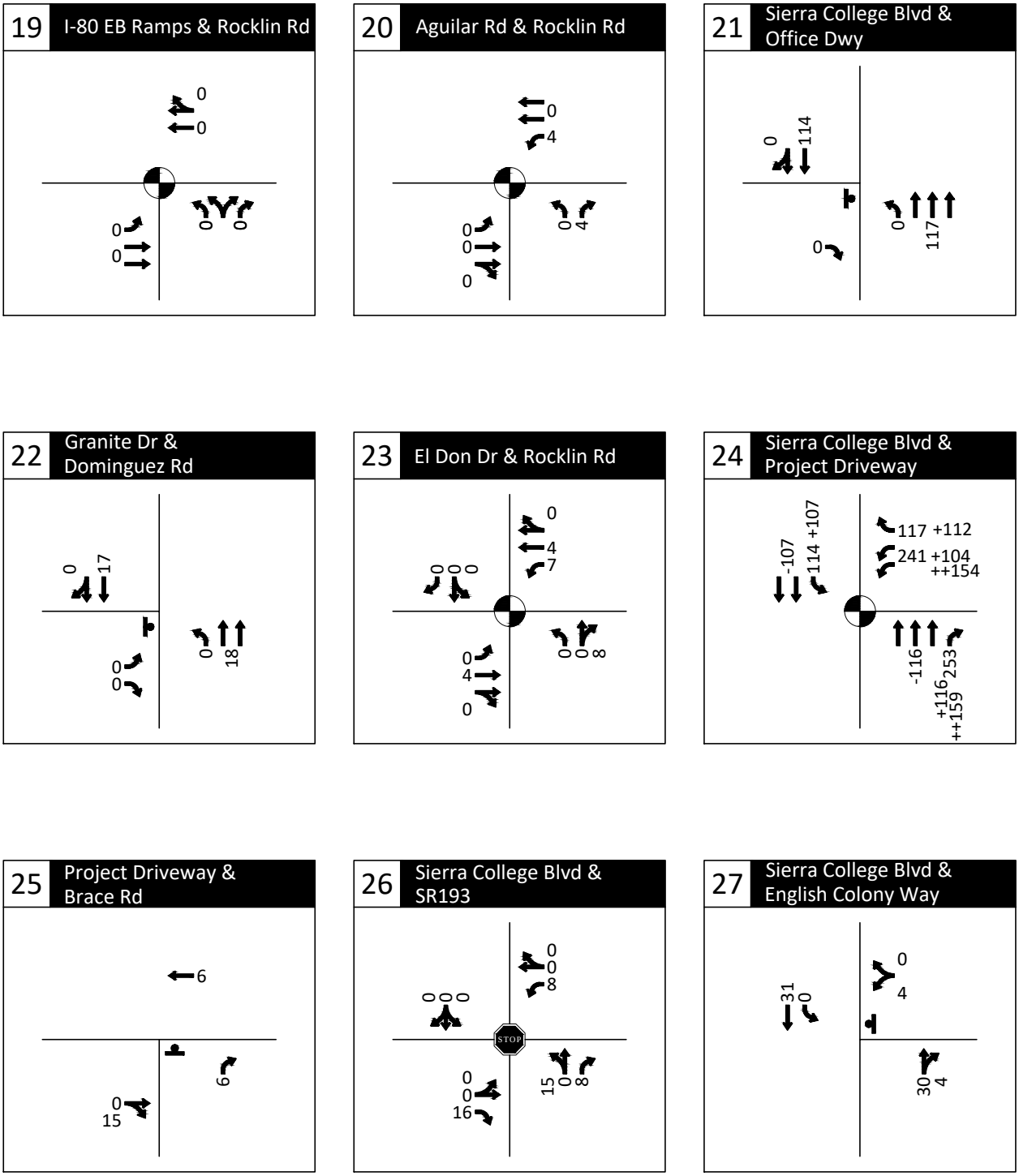
- Stop Sign ++## - Diverted Trips

- Traffic Signal (##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekend Midday Peak Hour
Loomis, California

Figure
G4-B

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:48pm - aloveday Layout Tab: SAT_PO_PB_DT-B



- Weekend Midday Traffic Volume +## - Pass by Trips

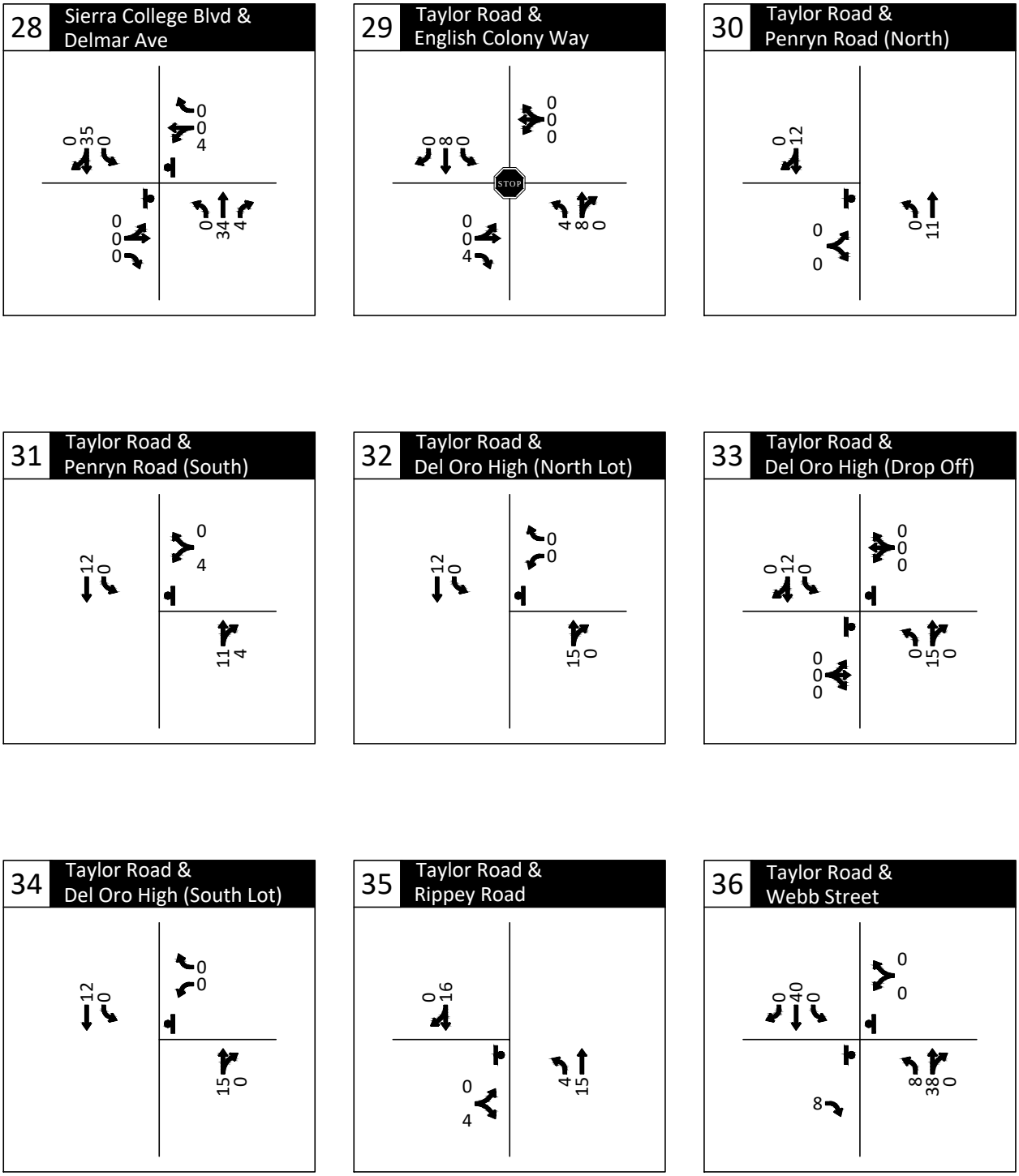
- Stop Sign ++## - Diverted Trips

- Traffic Signal (##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekend Midday Peak Hour
Loomis, California

Figure
G4-C

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:49pm - aloveday Layout Tab: SAT_PO_PB_DT-C

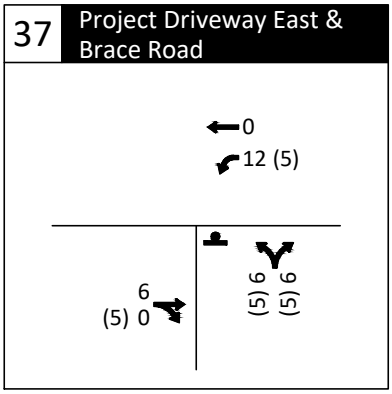


- Weekend Midday Traffic Volume
+## - Pass by Trips
- Stop Sign
++## - Diverted Trips
- Traffic Signal
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekend Midday Peak Hour
Loomis, California

Figure
G4-D

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:49pm - aloveday Layout Tab: SAT_PO_PB_DT-D



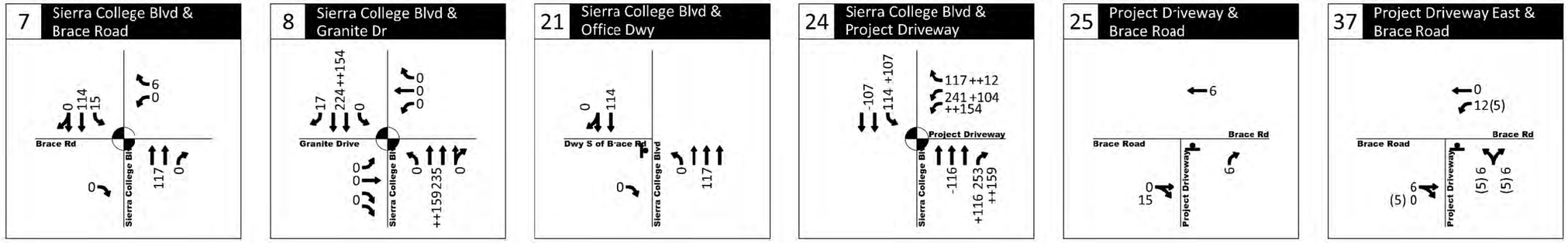
- Weekend Midday Traffic Volume
+## - Pass by Trips
- Stop Sign
++## - Diverted Trips
- Traffic Signal
(##) - Apartment Re-Assigned Trips

Project Trip Assignment
Weekend Midday Peak Hour
Loomis, California

Figure
G4-E

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20190703 - Option A.dwg Oct 22, 2019 - 3:50pm - aloveday Layout Tab: SAT_PO_PB_DT-E

OPTION 1A



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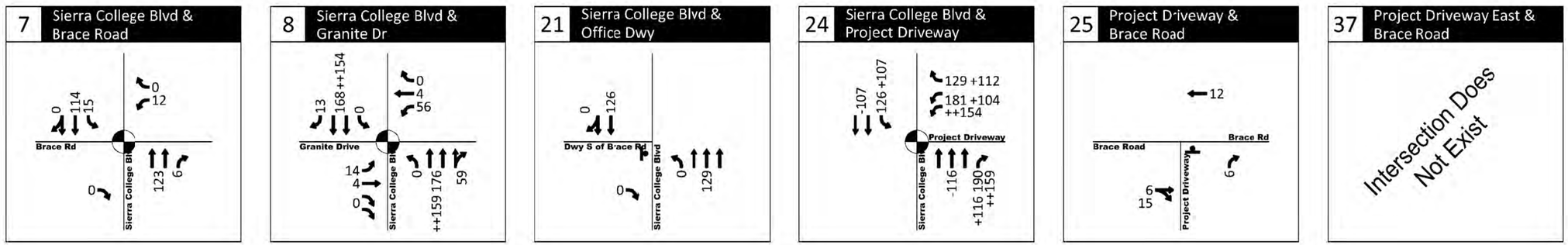
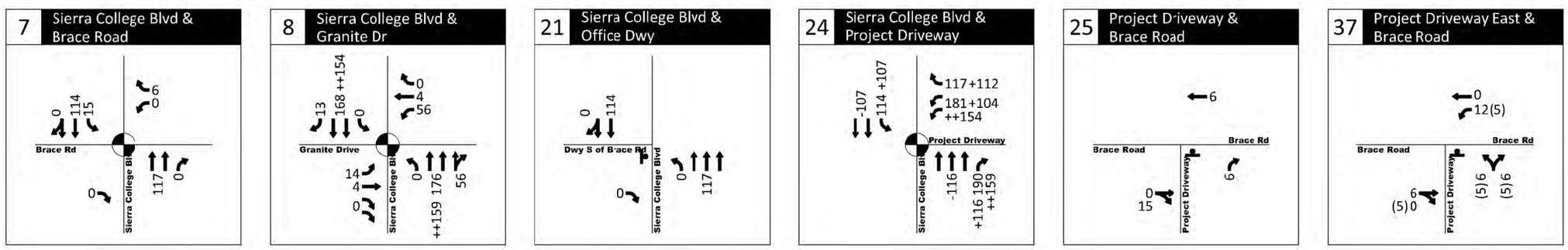


OPTION 1C



- Weekend Midday Traffic Volume
- Stop Sign
- Traffic Signal

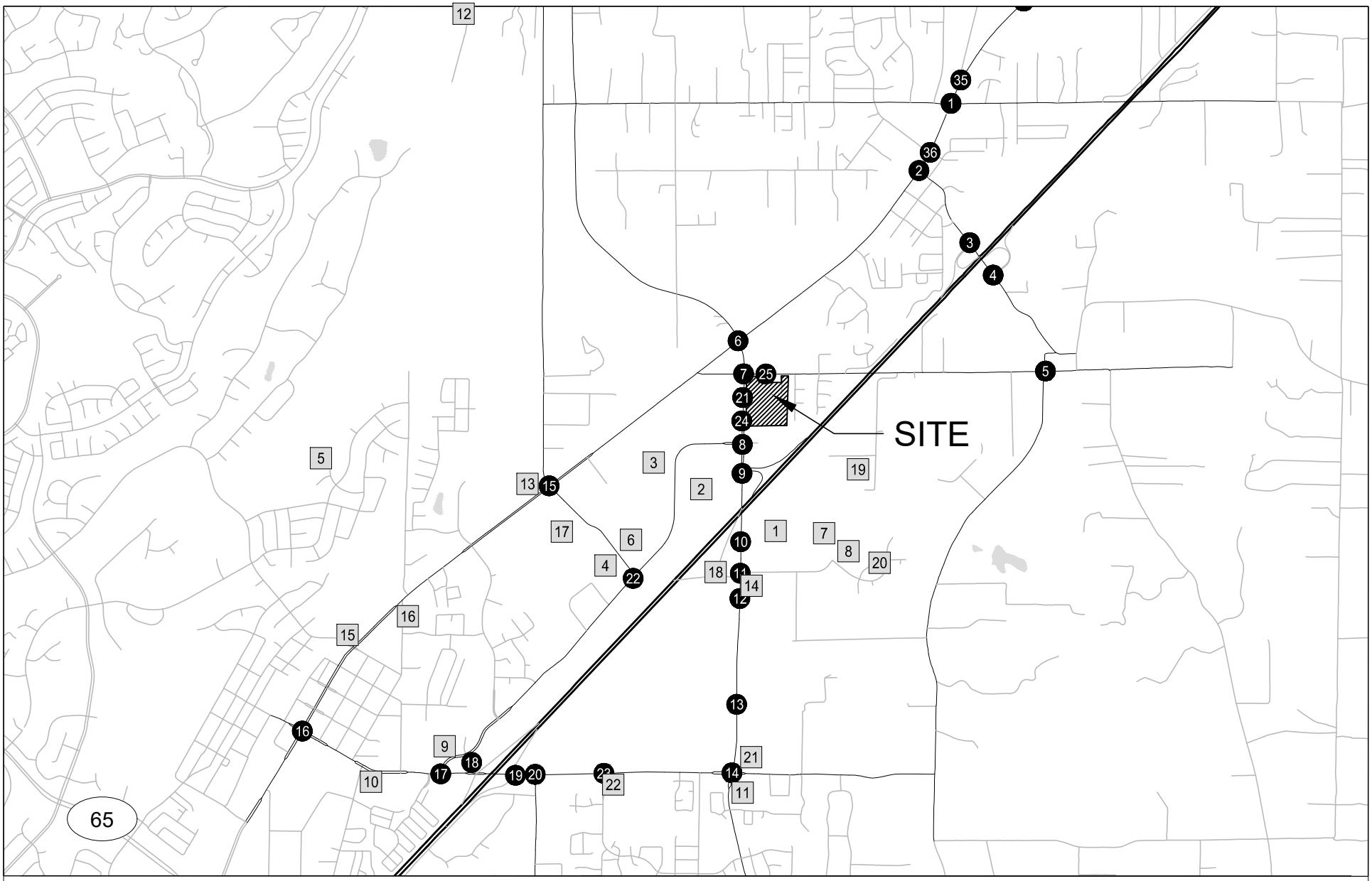
+## - Pass by Trips
++## - Diverted Trips
(##) - Apartment Re-Assigned Trips

Project Driveway Options Trip Assignment
Weekend Midday Peak Hour
Loomis, California

Figure
G4-F

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig03_20190703.dwg Oct 22, 2019 - 1:39pm - aloveday Layout Tab: SAT_PO_PB_DT

Appendix H: Approved/Pending Project Trip Generation



- Approved/Pending Projects

Approved/Pending Projects
Loomis, California

Figure

H:\20\20345 - Confidential Loomis Costco\dwgs\figs\20345_Fig02_20180131.dwg Dec 14, 2018 - 8:15am - lnuxoll Layout Tab: Approved and Future

KITTELSON & ASSOCIATES

TRIP GENERATION
LOOMIS COSTCO WAREHOUSE PROJECT

Table 1: Trip Generation Rates

Land Use	Rate	Daily	AM Peak Hour			PM Peak Hour			Sat Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Shopping Center (ITE Code 820)	per 1,000 sf	42.70	62%	38%	0.96	48%	52%	exp(0.67*ln(x)+3.31)	52%	48%	exp(0.65*ln(x)+3.78)
Single-Family Detached Housing (ITE Code 210)	per du	9.52	25%	75%	0.7*x+9.74	63%	37%	exp(0.90*ln(x)+0.51)	54%	46%	0.89*x+8.77
County Park(ITE Code 412)	per acre	2.3	61%	39%	0.02	61%	39%	0.09	57%	43%	2.21
Apartment (ITE Code 220)	per du	6.65	20%	80%	0.49*x+3.73	65%	35%	0.55*x+17.65	50%	50%	0.52
Senior Adult Housing - detached (ITE Code 251)	per du	4.27	33%	67%	0.24	61%	39%	0.30	48%	52%	0.23
Elementary School (ITE Code 520)	per student	1.89	54%	46%	0.67						

*use County park instead of City Park since City park does not have peak hour general
*direction percentage is borrowed from Sunday

Table 2: Trip Generation Estimates

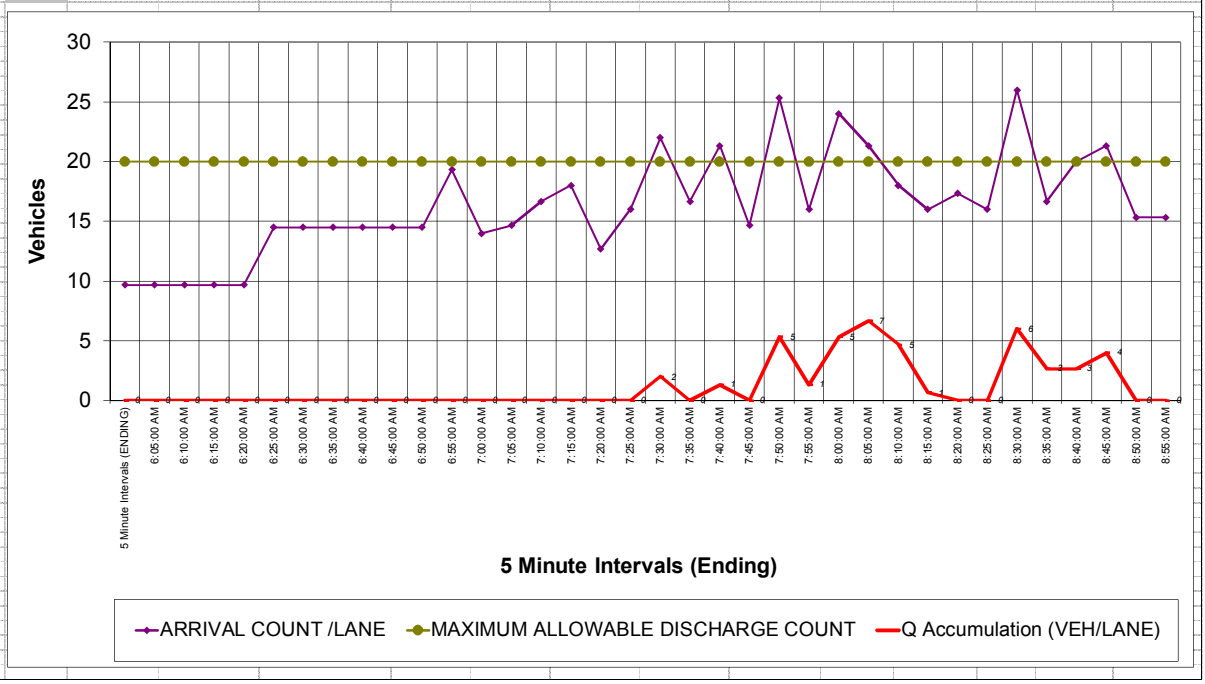
ID	Name	Land Use	Size		Daily	AM Peak Hour			PM Peak Hour			Sat Peak Hour			LOC
						In	Out	Total	In	Out	Total	In	Out	Total	
1	Rockling Crossings	Shopping Center (ITE Code 820)	83	ksf	3,544	50	30	80	254	275	529	403	372	775	SE quadrant of I-80/Sierra College Blvd.
2	Rocklin Commons	Shopping Center (ITE Code 820)	120	ksf	5,124	71	44	115	325	352	677	512	472	984	NW quadrant of I-80/Sierra College Blvd.
3	Garnet Creek	Single Family (ITE Code 210)	81	du	1,142	17	49	66	55	32	87	44	37	81	On Granite Drive, opposite Target
		Apartmennt(ITE Code 220)	260	du	1,729	26	105	131	104	57	161	68	67	135	
4	Granite Dominguez Subdivision	Single Family (ITE Code 210)	71	du	676	15	44	59	49	28	77	39	33	72	On Granite Drive, west of Dominguez Rd.
5	Los Cerros Subdivision	Single Family (ITE Code 210)	115	du	1,095	23	67	90	75	44	119	60	51	111	On ridge along Hillside Dr.
6	Brighton Subdivision	Single Family (ITE Code 210)	72	du	685	15	45	60	49	29	78	39	34	73	NE corner of Granite and Dominguez
7	Rocklin 60	Single Family (ITE Code 210)	179	du	1,704	34	101	135	112	65	177	91	77	168	Behind Rocklin Crossings along Schriber Way
8	Croftwood	Single Family (ITE Code 210)	51	du	486	11	34	45	36	21	57	29	25	54	East of Schriber Way
9	Granite Terrace	Single Family (ITE Code 210)	42	du	400	10	29	39	30	18	48	25	21	46	Behind Rocklin library
10	Avalon Subdivision	Single Family (ITE Code 210)	76	du	724	16	47	63	52	30	82	41	35	76	On Rocklin Road east of Grove Street
11	Sierra Gateway Apts	Apartmennt(ITE Code 220)	195	du	1,297	20	79	99	81	44	125	51	50	101	SE corner of Rocklin Road/Sierra College Blvd.
12	Clover Valley Residential	Single Family (ITE Code 210)	558	du	5,312	100	300	400	311	183	494	273	232	505	West of Sierra College Boulevard and east of Whitney Oaks
13	Parklands Subdivision	Single Family (ITE Code 210)	142	du	1,352	27	82	109	91	53	144	73	62	135	North of Pacific Street west of Del Mar Ave.
14	The Center at Secret Ravine	Shopping Center (ITE Code 820)	16	*ksf*	683	9	6	15	84	91	175	138	128	266	East of Sierra College south Rocklin Crossings
15	Rocklin Gateway Apartment	Apartmennt(ITE Code 220)	204	du	1,357	21	83	104	84	46	130	53	53	106	North of Pacific St, and east of Midas Ave.
16	Quarry Row Subdivision	Single Family (ITE Code 210)	64	du	609	14	41	55	44	26	70	35	31	66	Southeast corner of Grove and Pacific Streets
17	Sierra Pine Subdivision	Single Family (ITE Code 210)	199	du	1,894	37	112	149	123	72	195	100	86	186	West side of Dominguez Road, between Pacific Street and Granite Drive
18	Rocklin Station*	Shopping Center (ITE Code 820)	33	ksf	1,409	20	12	32	137	148	285	221	204	425	West side of Sierra College Boulevard directly south of the I-80 SCB Interchange
19	Oak Vista Subdivision	Single Family (ITE Code 210)	63	du	600	13	41	54	44	25	69	35	30	65	r of Makabe Lane and Dias Lane, adjacent on one boundary to the eastern city limits o
20	Croftwood 2	Single Family (ITE Code 210)	63	*du*	600	13	41	54	44	25	69	35	30	65	West side of Barton Road at the Terminus of Lakepointe Drive
21	Sierra Villages North (SCB Site)	Single Family (ITE Code 210)	349	du	3,322	64	190	254	204	120	324	172	147	319	North Village: NE corner of Rocklin Rd./Sierra College Blvd. (72 +/- acres)
		mixed use (No additional details provided, instructe	15.9	acres											
		park	14.8	acres	34	0	0	0	1	0	1	19	14	33	
22	Sierra Villages South (Rocklin Road S	Single Family (ITE Code 210)	37	du	352	9	27	36	27	16	43	23	19	42	South Village: SE corner of Rocklin Rd./El Don Dr. (36+/- acres)
		mixed use (No additional details provided, instructe	11.6	acres											
		park	16.4	acres	37	0	0	0	1	0	1	21	16	36	
23	Bickford Ranch Phase 1 (949.5 acres)	Single Family (Traditional)	470	du	4,474	88	265	353	296	174	470	231	196	427	
		Single Family (Active-Adut)	475	du	3,496	34	71	105	78	51	129	52	57	109	
		Recreation Center	7.35	acres	1,000	13	13	25	25	25	50	25	25	50	
		Elementary School	250	students	645	61	52	113	0	0	0	0	0	0	
				Internal Capture	-2,145	-75	-75	-150	-38	-38	-75	-38	-38	-75	
				External Trips	**7,470**	**121**	**324**	**445**	**362**	**212**	**574**	**271**	**241**	**511**	
24	Amazing Facts Phase 1	Church	1650	Seats	0	0	0	0	0	0	0	426	564	990	
TOTAL					**36,167**	**635**	**1,611**	**2,246**	**2,416**	**1,802**	**4,219**	**2,599**	**2,327**	**4,926**	

Notes:
du - dwelling units
SF - square feet

Appendix I: Ramp Metering Worksheets

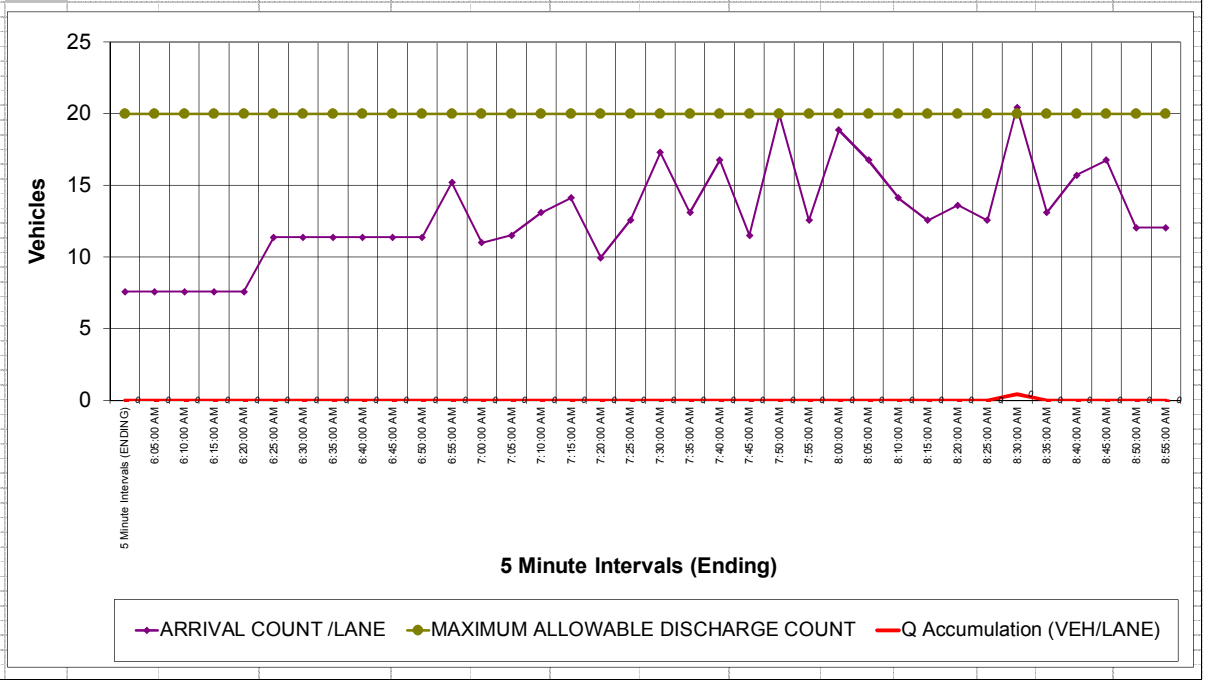
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Exist AM

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
6:05:00 AM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
6:10:00 AM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
6:15:00 AM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
6:20:00 AM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
6:25:00 AM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
6:30:00 AM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
6:35:00 AM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
6:40:00 AM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
6:45:00 AM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
6:50:00 AM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
6:55:00 AM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
7:00:00 AM	19	20	0		232	29	240	-	-	1200	-	-	0	0.0
7:05:00 AM	14	20	0		168	21	240	-	-	1200	-	-	0	0.0
7:10:00 AM	15	20	0		176	22	240	-	-	1200	-	-	0	0.0
7:15:00 AM	17	20	0		200	25	240	-	-	1200	-	-	0	0.0
7:20:00 AM	18	20	0		216	27	240	-	-	1200	-	-	0	0.0
7:25:00 AM	13	20	0		152	19	240	-	-	1200	-	-	0	0.0
7:30:00 AM	16	20	0		192	24	240	-	-	1200	-	-	0	0.0
7:35:00 AM	22	20	2	2	264	33	240	250	-	1200	50	-	22	0.2
7:40:00 AM	17	20	0		200	25	240	-	-	1200	-	-	0	0.0
7:45:00 AM	21	20	1	1	256	32	240	250	-	1200	33	-	21	0.1
7:50:00 AM	15	20	0		176	22	240	-	-	1200	-	-	0	0.0
7:55:00 AM	25	20	5	5	304	38	240	350	-	1200	133	-	25	0.4
8:00:00 AM	16	20	1		192	24	240	200	-	1200	33	-	16	0.1
8:05:00 AM	24	20	5	4	288	36	240	350	-	1200	133	-	24	0.4
8:10:00 AM	21	20	7	1	256	32	240	300	-	1200	167	-	21	0.6
8:15:00 AM	18	20	5		216	27	240	250	-	1200	117	-	18	0.4
8:20:00 AM	16	20	1		192	24	240	200	-	1200	17	-	16	0.1
8:25:00 AM	17	20	0		208	26	240	-	-	1200	-	-	0	0.0
8:30:00 AM	16	20	0		192	24	240	-	-	1200	-	-	0	0.0
8:35:00 AM	26	20	6	6	312	39	240	350	-	1200	150	-	26	0.5
8:40:00 AM	17	20	3		200	25	240	200	-	1200	67	-	17	0.2
8:45:00 AM	20	20	3		240	30	240	250	-	1200	67	-	20	0.2
8:50:00 AM	21	20	4	1	256	32	240	300	-	1200	100	-	21	0.3
8:55:00 AM	15	20	0		184	23	240	-	-	1200	-	-	0	0.0
9:00:00 AM	15	20	0		184	23	240	-	-	1200	-	-	0	0.0
	590	**720**		**21**		**885**							**248**	**3.56**
		MAX Q (VEH/LN)=	**7**	**MAX RATE (VPH)=**	**312**					**MAX Q (FT/LN)=**	**167**	**-**	**26**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**240**				Avg Delay/veh (hr)=		0.014	
LANES=	**1.5**	1.5									**Avg Delay/veh (sec)=**		**52**	
Ramp Length=	1200	167	FEET =	51	METERS									
Car Length (ft)=	25	8	METERS											



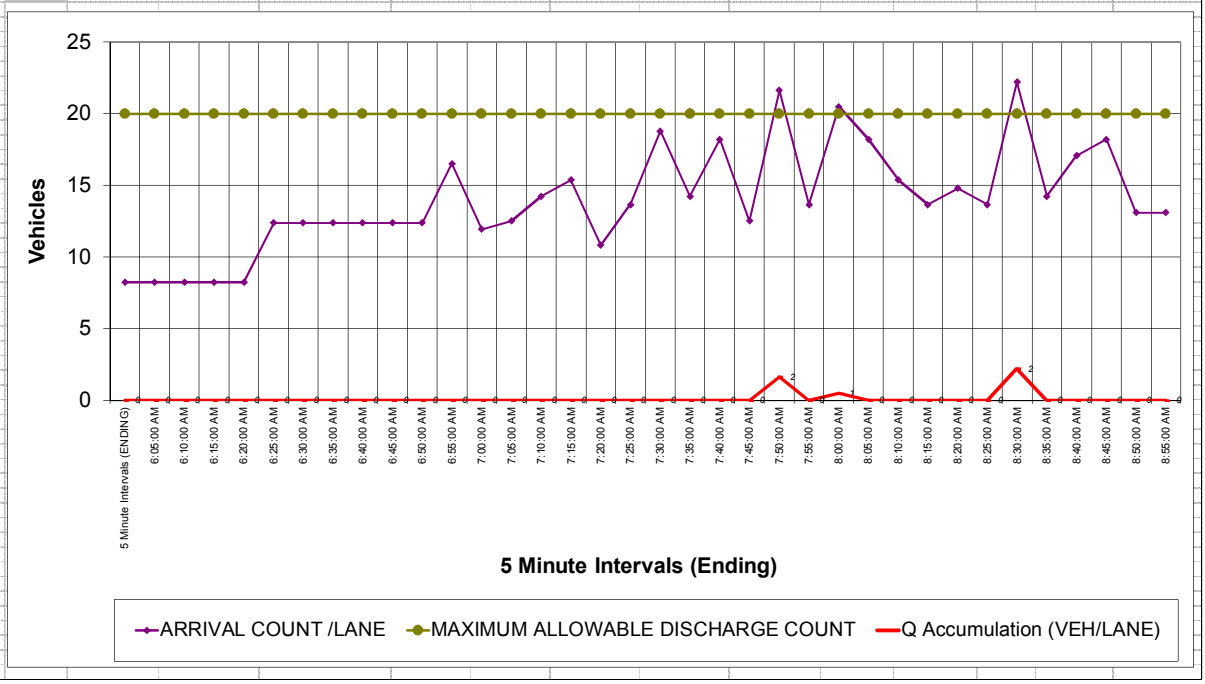
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Short AM

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
6:05:00 AM	8	20	0		91	11	240	-	-	1200	-	-	0	0.0
6:10:00 AM	8	20	0		91	11	240	-	-	1200	-	-	0	0.0
6:15:00 AM	8	20	0		91	11	240	-	-	1200	-	-	0	0.0
6:20:00 AM	8	20	0		91	11	240	-	-	1200	-	-	0	0.0
6:25:00 AM	8	20	0		91	11	240	-	-	1200	-	-	0	0.0
6:30:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
6:35:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
6:40:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
6:45:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
6:50:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
6:55:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
7:00:00 AM	15	20	0		182	23	240	-	-	1200	-	-	0	0.0
7:05:00 AM	11	20	0		132	17	240	-	-	1200	-	-	0	0.0
7:10:00 AM	12	20	0		138	17	240	-	-	1200	-	-	0	0.0
7:15:00 AM	13	20	0		157	20	240	-	-	1200	-	-	0	0.0
7:20:00 AM	14	20	0		170	21	240	-	-	1200	-	-	0	0.0
7:25:00 AM	10	20	0		119	15	240	-	-	1200	-	-	0	0.0
7:30:00 AM	13	20	0		151	19	240	-	-	1200	-	-	0	0.0
7:35:00 AM	17	20	0		208	26	240	-	-	1200	-	-	0	0.0
7:40:00 AM	13	20	0		157	20	240	-	-	1200	-	-	0	0.0
7:45:00 AM	17	20	0		201	25	240	-	-	1200	-	-	0	0.0
7:50:00 AM	12	20	0		138	17	240	-	-	1200	-	-	0	0.0
7:55:00 AM	20	20	0		239	30	240	-	-	1200	-	-	0	0.0
8:00:00 AM	13	20	0		151	19	240	-	-	1200	-	-	0	0.0
8:05:00 AM	19	20	0		226	28	240	-	-	1200	-	-	0	0.0
8:10:00 AM	17	20	0		201	25	240	-	-	1200	-	-	0	0.0
8:15:00 AM	14	20	0		170	21	240	-	-	1200	-	-	0	0.0
8:20:00 AM	13	20	0		151	19	240	-	-	1200	-	-	0	0.0
8:25:00 AM	14	20	0		163	20	240	-	-	1200	-	-	0	0.0
8:30:00 AM	13	20	0		151	19	240	-	-	1200	-	-	0	0.0
8:35:00 AM	20	20	0	0	245	31	240	250	-	1200	11	-	20	0.0
8:40:00 AM	13	20	0		157	20	240	-	-	1200	-	-	0	0.0
8:45:00 AM	16	20	0		189	24	240	-	-	1200	-	-	0	0.0
8:50:00 AM	17	20	0		201	25	240	-	-	1200	-	-	0	0.0
8:55:00 AM	12	20	0		145	18	240	-	-	1200	-	-	0	0.0
9:00:00 AM	12	20	0		145	18	240	-	-	1200	-	-	0	0.0
	464	**720**		**0**		**696**							**20**	**0.04**
		MAX Q (VEH/LN)=	**0**	**MAX RATE (VPH)=**	**245**					**MAX Q (FT/LN)=**	**11**	-	**20**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**240**				Avg Delay/veh (hr)=		0.002	
LANES=	**1.5**	1					4	vps/lane			**Avg Delay/veh (sec)=**		**6**	
Ramp Length=	1200	11	FEET =	3	METERS									
Car Length (ft)=	25	8	METERS											



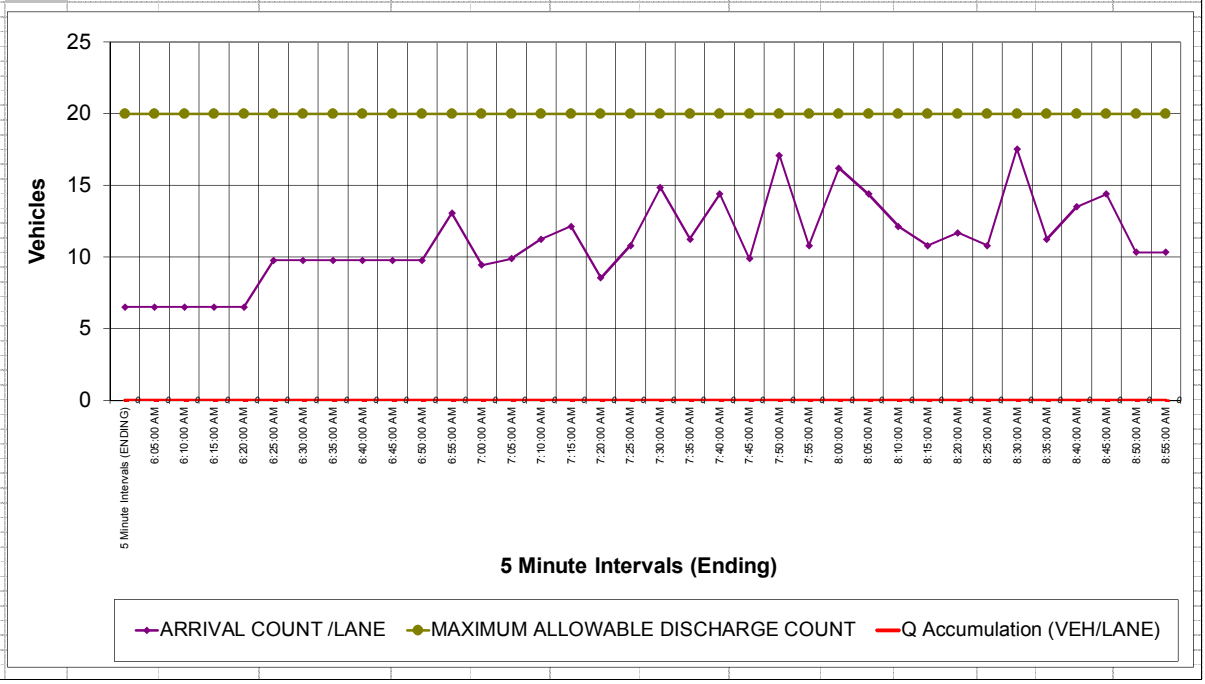
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Short AM Proj

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
6:05:00 AM	8	20	0		99	12	240	-	-	1200	-	-	0	0.0
6:10:00 AM	8	20	0		99	12	240	-	-	1200	-	-	0	0.0
6:15:00 AM	8	20	0		99	12	240	-	-	1200	-	-	0	0.0
6:20:00 AM	8	20	0		99	12	240	-	-	1200	-	-	0	0.0
6:25:00 AM	8	20	0		99	12	240	-	-	1200	-	-	0	0.0
6:30:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
6:35:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
6:40:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
6:45:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
6:50:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
6:55:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
7:00:00 AM	17	20	0		198	25	240	-	-	1200	-	-	0	0.0
7:05:00 AM	12	20	0		144	18	240	-	-	1200	-	-	0	0.0
7:10:00 AM	13	20	0		150	19	240	-	-	1200	-	-	0	0.0
7:15:00 AM	14	20	0		171	21	240	-	-	1200	-	-	0	0.0
7:20:00 AM	15	20	0		185	23	240	-	-	1200	-	-	0	0.0
7:25:00 AM	11	20	0		130	16	240	-	-	1200	-	-	0	0.0
7:30:00 AM	14	20	0		164	21	240	-	-	1200	-	-	0	0.0
7:35:00 AM	19	20	0		226	28	240	-	-	1200	-	-	0	0.0
7:40:00 AM	14	20	0		171	21	240	-	-	1200	-	-	0	0.0
7:45:00 AM	18	20	0		219	27	240	-	-	1200	-	-	0	0.0
7:50:00 AM	13	20	0		150	19	240	-	-	1200	-	-	0	0.0
7:55:00 AM	22	20	2	2	260	32	240	250	-	1200	41	-	22	0.1
8:00:00 AM	14	20	0		164	21	240	-	-	1200	-	-	0	0.0
8:05:00 AM	21	20	1	1	246	31	240	250	-	1200	13	-	21	0.0
8:10:00 AM	18	20	0		219	27	240	-	-	1200	-	-	0	0.0
8:15:00 AM	15	20	0		185	23	240	-	-	1200	-	-	0	0.0
8:20:00 AM	14	20	0		164	21	240	-	-	1200	-	-	0	0.0
8:25:00 AM	15	20	0		178	22	240	-	-	1200	-	-	0	0.0
8:30:00 AM	14	20	0		164	21	240	-	-	1200	-	-	0	0.0
8:35:00 AM	22	20	2	2	267	33	240	250	-	1200	55	-	22	0.2
8:40:00 AM	14	20	0		171	21	240	-	-	1200	-	-	0	0.0
8:45:00 AM	17	20	0		205	26	240	-	-	1200	-	-	0	0.0
8:50:00 AM	18	20	0		219	27	240	-	-	1200	-	-	0	0.0
8:55:00 AM	13	20	0		157	20	240	-	-	1200	-	-	0	0.0
9:00:00 AM	13	20	0		157	20	240	-	-	1200	-	-	0	0.0
	504	**720**		**4**		**756**							**64**	**0.36**
		MAX Q (VEH/LN)=	**2**	**MAX RATE (VPH)=**	**267**					**MAX Q (FT/LN)=**	**55**	-	**22**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**240**				Avg Delay/veh (hr)=		0.006	
LANES=	**1.5**	1					4	vps/lane			**Avg Delay/veh (sec)=**		**20**	
Ramp Length=	1200	55	FEET =	17	METERS									
Car Length (ft)=	25	8	METERS											



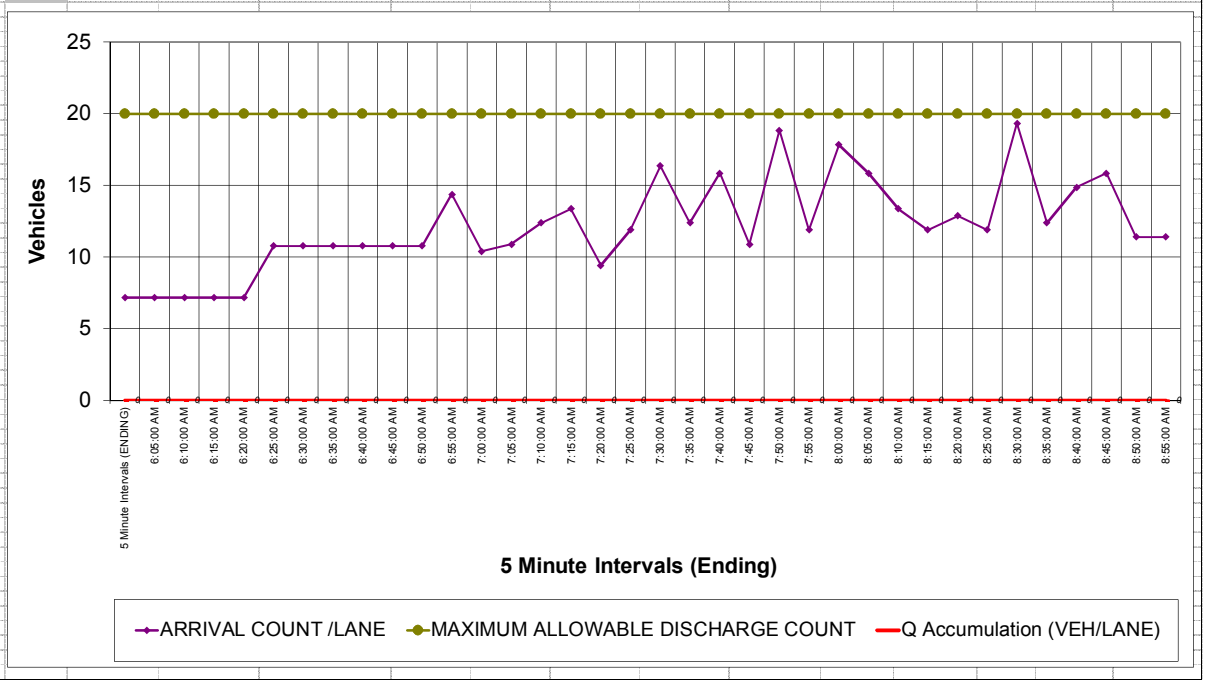
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ 2035 AM

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
6:05:00 AM	7	20	0		78	10	240	-	-	1200	-	-	0	0.0
6:10:00 AM	7	20	0		78	10	240	-	-	1200	-	-	0	0.0
6:15:00 AM	7	20	0		78	10	240	-	-	1200	-	-	0	0.0
6:20:00 AM	7	20	0		78	10	240	-	-	1200	-	-	0	0.0
6:25:00 AM	7	20	0		78	10	240	-	-	1200	-	-	0	0.0
6:30:00 AM	10	20	0		117	15	240	-	-	1200	-	-	0	0.0
6:35:00 AM	10	20	0		117	15	240	-	-	1200	-	-	0	0.0
6:40:00 AM	10	20	0		117	15	240	-	-	1200	-	-	0	0.0
6:45:00 AM	10	20	0		117	15	240	-	-	1200	-	-	0	0.0
6:50:00 AM	10	20	0		117	15	240	-	-	1200	-	-	0	0.0
6:55:00 AM	10	20	0		117	15	240	-	-	1200	-	-	0	0.0
7:00:00 AM	13	20	0		157	20	240	-	-	1200	-	-	0	0.0
7:05:00 AM	9	20	0		113	14	240	-	-	1200	-	-	0	0.0
7:10:00 AM	10	20	0		119	15	240	-	-	1200	-	-	0	0.0
7:15:00 AM	11	20	0		135	17	240	-	-	1200	-	-	0	0.0
7:20:00 AM	12	20	0		146	18	240	-	-	1200	-	-	0	0.0
7:25:00 AM	9	20	0		103	13	240	-	-	1200	-	-	0	0.0
7:30:00 AM	11	20	0		130	16	240	-	-	1200	-	-	0	0.0
7:35:00 AM	15	20	0		178	22	240	-	-	1200	-	-	0	0.0
7:40:00 AM	11	20	0		135	17	240	-	-	1200	-	-	0	0.0
7:45:00 AM	14	20	0		173	22	240	-	-	1200	-	-	0	0.0
7:50:00 AM	10	20	0		119	15	240	-	-	1200	-	-	0	0.0
7:55:00 AM	17	20	0		205	26	240	-	-	1200	-	-	0	0.0
8:00:00 AM	11	20	0		130	16	240	-	-	1200	-	-	0	0.0
8:05:00 AM	16	20	0		194	24	240	-	-	1200	-	-	0	0.0
8:10:00 AM	14	20	0		173	22	240	-	-	1200	-	-	0	0.0
8:15:00 AM	12	20	0		146	18	240	-	-	1200	-	-	0	0.0
8:20:00 AM	11	20	0		130	16	240	-	-	1200	-	-	0	0.0
8:25:00 AM	12	20	0		140	18	240	-	-	1200	-	-	0	0.0
8:30:00 AM	11	20	0		130	16	240	-	-	1200	-	-	0	0.0
8:35:00 AM	18	20	0		211	26	240	-	-	1200	-	-	0	0.0
8:40:00 AM	11	20	0		135	17	240	-	-	1200	-	-	0	0.0
8:45:00 AM	14	20	0		162	20	240	-	-	1200	-	-	0	0.0
8:50:00 AM	14	20	0		173	22	240	-	-	1200	-	-	0	0.0
8:55:00 AM	10	20	0		124	16	240	-	-	1200	-	-	0	0.0
9:00:00 AM	10	20	0		124	16	240	-	-	1200	-	-	0	0.0
	398	**720**		**-**		**598**							**-**	**0.00**
		MAX Q (VEH/LN)=	**-**	**MAX RATE (VPH)=**	**211**					**MAX Q (FT/LN)=**	**-**	**-**	**-**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**240**				Avg Delay/veh (hr)=		#DIV/0!	
LANES=	**1.5**	1					4	vps/lane			**Avg Delay/veh (sec)=**		**#DIV/0!**	
Ramp Length=	1200	-	FEET =	-	METERS									
Car Length (ft)=	25	8	METERS											



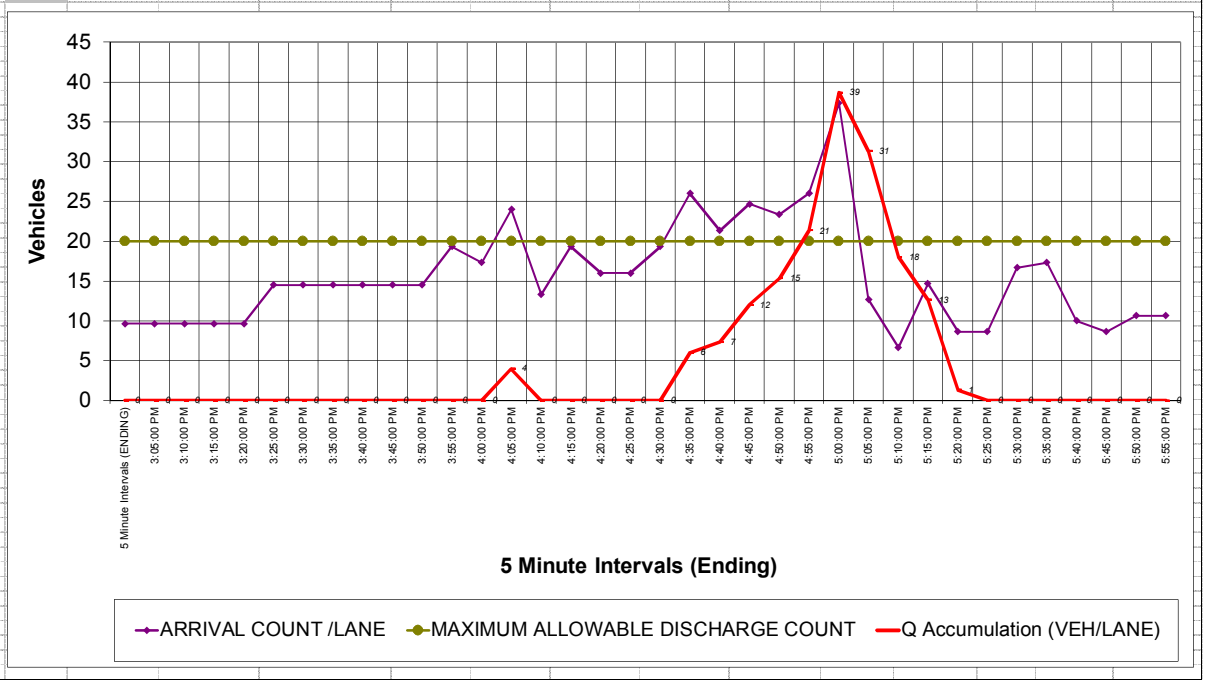
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ 2035 AM Proj

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
6:05:00 AM	7	20	0		86	11	240	-	-	1200	-	-	0	0.0
6:10:00 AM	7	20	0		86	11	240	-	-	1200	-	-	0	0.0
6:15:00 AM	7	20	0		86	11	240	-	-	1200	-	-	0	0.0
6:20:00 AM	7	20	0		86	11	240	-	-	1200	-	-	0	0.0
6:25:00 AM	7	20	0		86	11	240	-	-	1200	-	-	0	0.0
6:30:00 AM	11	20	0		129	16	240	-	-	1200	-	-	0	0.0
6:35:00 AM	11	20	0		129	16	240	-	-	1200	-	-	0	0.0
6:40:00 AM	11	20	0		129	16	240	-	-	1200	-	-	0	0.0
6:45:00 AM	11	20	0		129	16	240	-	-	1200	-	-	0	0.0
6:50:00 AM	11	20	0		129	16	240	-	-	1200	-	-	0	0.0
6:55:00 AM	11	20	0		129	16	240	-	-	1200	-	-	0	0.0
7:00:00 AM	14	20	0		173	22	240	-	-	1200	-	-	0	0.0
7:05:00 AM	10	20	0		125	16	240	-	-	1200	-	-	0	0.0
7:10:00 AM	11	20	0		131	16	240	-	-	1200	-	-	0	0.0
7:15:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
7:20:00 AM	13	20	0		161	20	240	-	-	1200	-	-	0	0.0
7:25:00 AM	9	20	0		113	14	240	-	-	1200	-	-	0	0.0
7:30:00 AM	12	20	0		143	18	240	-	-	1200	-	-	0	0.0
7:35:00 AM	16	20	0		196	25	240	-	-	1200	-	-	0	0.0
7:40:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
7:45:00 AM	16	20	0		190	24	240	-	-	1200	-	-	0	0.0
7:50:00 AM	11	20	0		131	16	240	-	-	1200	-	-	0	0.0
7:55:00 AM	19	20	0		226	28	240	-	-	1200	-	-	0	0.0
8:00:00 AM	12	20	0		143	18	240	-	-	1200	-	-	0	0.0
8:05:00 AM	18	20	0		214	27	240	-	-	1200	-	-	0	0.0
8:10:00 AM	16	20	0		190	24	240	-	-	1200	-	-	0	0.0
8:15:00 AM	13	20	0		161	20	240	-	-	1200	-	-	0	0.0
8:20:00 AM	12	20	0		143	18	240	-	-	1200	-	-	0	0.0
8:25:00 AM	13	20	0		155	19	240	-	-	1200	-	-	0	0.0
8:30:00 AM	12	20	0		143	18	240	-	-	1200	-	-	0	0.0
8:35:00 AM	19	20	0		232	29	240	-	-	1200	-	-	0	0.0
8:40:00 AM	12	20	0		149	19	240	-	-	1200	-	-	0	0.0
8:45:00 AM	15	20	0		178	22	240	-	-	1200	-	-	0	0.0
8:50:00 AM	16	20	0		190	24	240	-	-	1200	-	-	0	0.0
8:55:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
9:00:00 AM	11	20	0		137	17	240	-	-	1200	-	-	0	0.0
	439	**720**		**-**		**658**							**-**	**0.00**
		MAX Q (VEH/LN)=	**-**	**MAX RATE (VPH)=**	**232**					**MAX Q (FT/LN)=**	**-**	**-**	**-**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**240**				Avg Delay/veh (hr)=		#DIV/0!	
LANES=	**1.5**	1					4	vps/lane			**Avg Delay/veh (sec)=**		**#DIV/0!**	
Ramp Length=	1200	-	FEET =	-	METERS									
Car Length (ft)=	25	8	METERS											



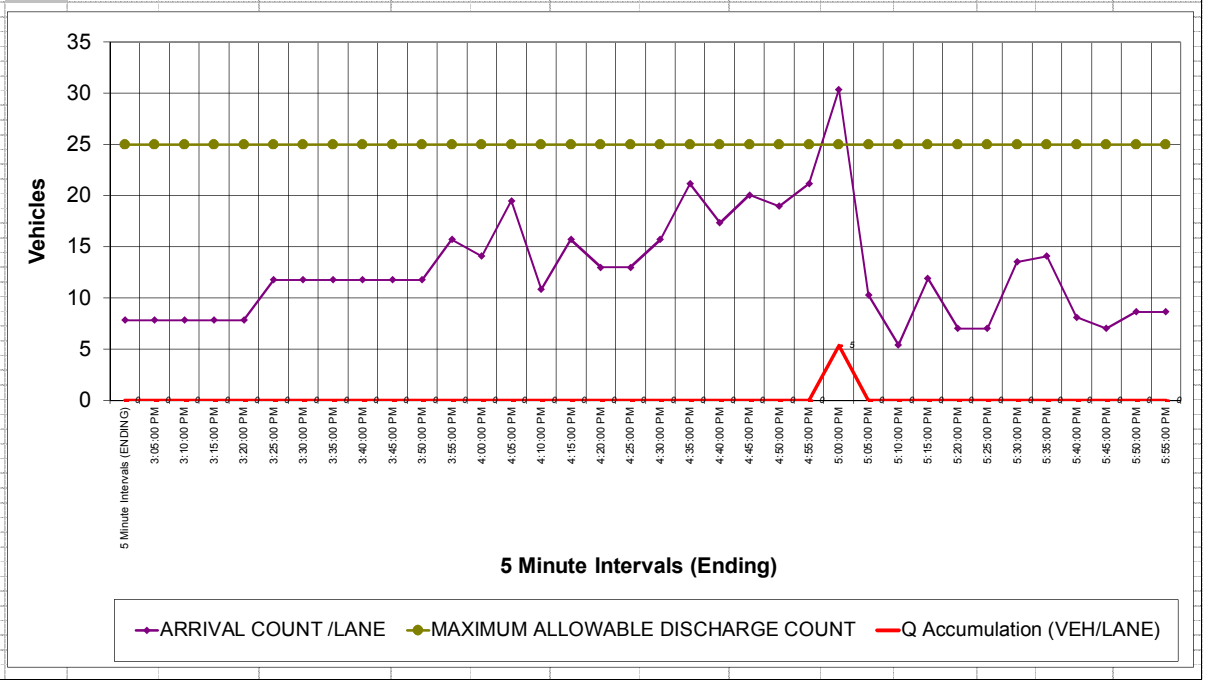
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Exist PM

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
3:05:00 PM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
3:10:00 PM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
3:15:00 PM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
3:20:00 PM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
3:25:00 PM	10	20	0		116	15	240	-	-	1200	-	-	0	0.0
3:30:00 PM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
3:35:00 PM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
3:40:00 PM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
3:45:00 PM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
3:50:00 PM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
3:55:00 PM	15	20	0		174	22	240	-	-	1200	-	-	0	0.0
4:00:00 PM	19	20	0		232	29	240	-	-	1200	-	-	0	0.0
4:05:00 PM	17	20	0		208	26	240	-	-	1200	-	-	0	0.0
4:10:00 PM	24	20	4	4	288	36	240	300	-	1200	100	-	24	0.3
4:15:00 PM	13	20	0		160	20	240	-	-	1200	-	-	0	0.0
4:20:00 PM	19	20	0		232	29	240	-	-	1200	-	-	0	0.0
4:25:00 PM	16	20	0		192	24	240	-	-	1200	-	-	0	0.0
4:30:00 PM	16	20	0		192	24	240	-	-	1200	-	-	0	0.0
4:35:00 PM	19	20	0		232	29	240	-	-	1200	-	-	0	0.0
4:40:00 PM	26	20	6	6	312	39	240	350	-	1200	150	-	26	0.5
4:45:00 PM	21	20	7	1	256	32	240	300	-	1200	183	-	21	0.6
4:50:00 PM	25	20	12	5	296	37	240	400	-	1200	300	-	25	1.0
4:55:00 PM	23	20	15	3	280	35	240	450	-	1200	383	-	23	1.3
5:00:00 PM	26	20	21	6	312	39	240	550	-	1200	533	-	26	1.8
5:05:00 PM	37	20	39	17	448	56	240	900	-	1200	967	-	37	3.2
5:10:00 PM	13	20	31		152	19	240	500	-	1200	783	-	13	2.6
5:15:00 PM	7	20	18		80	10	240	250	-	1200	450	-	7	1.5
5:20:00 PM	15	20	13		176	22	240	300	-	1200	317	-	15	1.1
5:25:00 PM	9	20	1		104	13	240	100	-	1200	33	-	9	0.1
5:30:00 PM	9	20	0		104	13	240	-	-	1200	-	-	0	0.0
5:35:00 PM	17	20	0		200	25	240	-	-	1200	-	-	0	0.0
5:40:00 PM	17	20	0		208	26	240	-	-	1200	-	-	0	0.0
5:45:00 PM	10	20	0		120	15	240	-	-	1200	-	-	0	0.0
5:50:00 PM	9	20	0		104	13	240	-	-	1200	-	-	0	0.0
5:55:00 PM	11	20	0		128	16	240	-	-	1200	-	-	0	0.0
6:00:00 PM	11	20	0		128	16	240	-	-	1200	-	-	0	0.0
	564	**720**		**43**		**846**							**225**	**14.00**
		MAX Q (VEH/LN)=	**39**	**MAX RATE (VPH)=**	**448**					**MAX Q (FT/LN)=**	**967**	-	**37**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**240**				Avg Delay/veh (hr)=		0.062	
LANES=	**1.5**	1					4	vps/lane			**Avg Delay/veh (sec)=**		**224**	
Ramp Length=	1200	967	FEET =	295	METERS									
Car Length (ft)=	25	8	METERS											



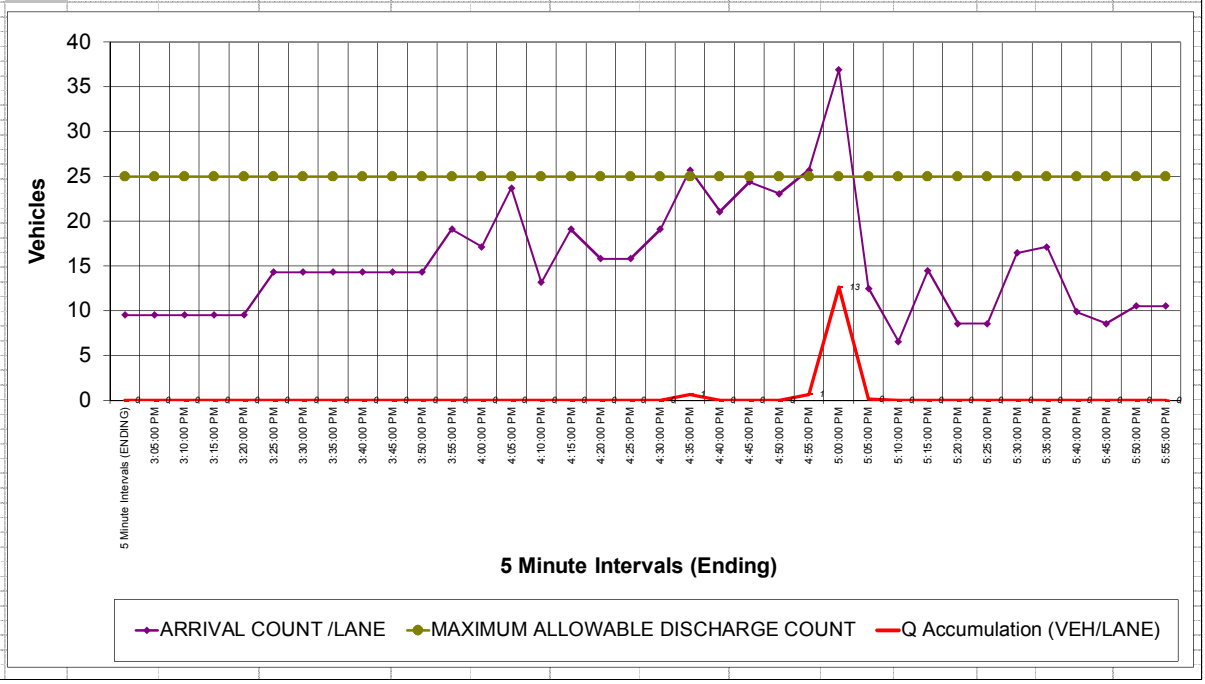
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Short PM

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
3:05:00 PM	8	25	0		94	12	300	-	-	1200	-	-	0	0.0
3:10:00 PM	8	25	0		94	12	300	-	-	1200	-	-	0	0.0
3:15:00 PM	8	25	0		94	12	300	-	-	1200	-	-	0	0.0
3:20:00 PM	8	25	0		94	12	300	-	-	1200	-	-	0	0.0
3:25:00 PM	8	25	0		94	12	300	-	-	1200	-	-	0	0.0
3:30:00 PM	12	25	0		142	18	300	-	-	1200	-	-	0	0.0
3:35:00 PM	12	25	0		142	18	300	-	-	1200	-	-	0	0.0
3:40:00 PM	12	25	0		142	18	300	-	-	1200	-	-	0	0.0
3:45:00 PM	12	25	0		142	18	300	-	-	1200	-	-	0	0.0
3:50:00 PM	12	25	0		142	18	300	-	-	1200	-	-	0	0.0
3:55:00 PM	12	25	0		142	18	300	-	-	1200	-	-	0	0.0
4:00:00 PM	16	25	0		189	24	300	-	-	1200	-	-	0	0.0
4:05:00 PM	14	25	0		169	21	300	-	-	1200	-	-	0	0.0
4:10:00 PM	20	25	0		234	29	300	-	-	1200	-	-	0	0.0
4:15:00 PM	11	25	0		130	16	300	-	-	1200	-	-	0	0.0
4:20:00 PM	16	25	0		189	24	300	-	-	1200	-	-	0	0.0
4:25:00 PM	13	25	0		156	20	300	-	-	1200	-	-	0	0.0
4:30:00 PM	13	25	0		156	20	300	-	-	1200	-	-	0	0.0
4:35:00 PM	16	25	0		189	24	300	-	-	1200	-	-	0	0.0
4:40:00 PM	21	25	0		254	32	300	-	-	1200	-	-	0	0.0
4:45:00 PM	17	25	0		208	26	300	-	-	1200	-	-	0	0.0
4:50:00 PM	20	25	0		241	30	300	-	-	1200	-	-	0	0.0
4:55:00 PM	19	25	0		228	28	300	-	-	1200	-	-	0	0.0
5:00:00 PM	21	25	0		254	32	300	-	-	1200	-	-	0	0.0
5:05:00 PM	30	25	5	5	364	46	300	400	-	1200	134	-	30	0.4
5:10:00 PM	10	25	0		124	15	300	-	-	1200	-	-	0	0.0
5:15:00 PM	5	25	0		65	8	300	-	-	1200	-	-	0	0.0
5:20:00 PM	12	25	0		143	18	300	-	-	1200	-	-	0	0.0
5:25:00 PM	7	25	0		85	11	300	-	-	1200	-	-	0	0.0
5:30:00 PM	7	25	0		85	11	300	-	-	1200	-	-	0	0.0
5:35:00 PM	14	25	0		163	20	300	-	-	1200	-	-	0	0.0
5:40:00 PM	14	25	0		169	21	300	-	-	1200	-	-	0	0.0
5:45:00 PM	8	25	0		98	12	300	-	-	1200	-	-	0	0.0
5:50:00 PM	7	25	0		85	11	300	-	-	1200	-	-	0	0.0
5:55:00 PM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
6:00:00 PM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
	459	**900**		**5**		**688**							**30**	**0.45**
		MAX Q (VEH/LN)=	**5**	**MAX RATE (VPH)=**	**364**					**MAX Q (FT/LN)=**	**134**	**-**	**30**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**300**				Avg Delay/veh (hr)=		0.015	
LANES=	**1.5**	1									**Avg Delay/veh (sec)=**		**53**	
Ramp Length=	1200	134	FEET =	41	METERS									
Car Length (ft)=	25	8	METERS											



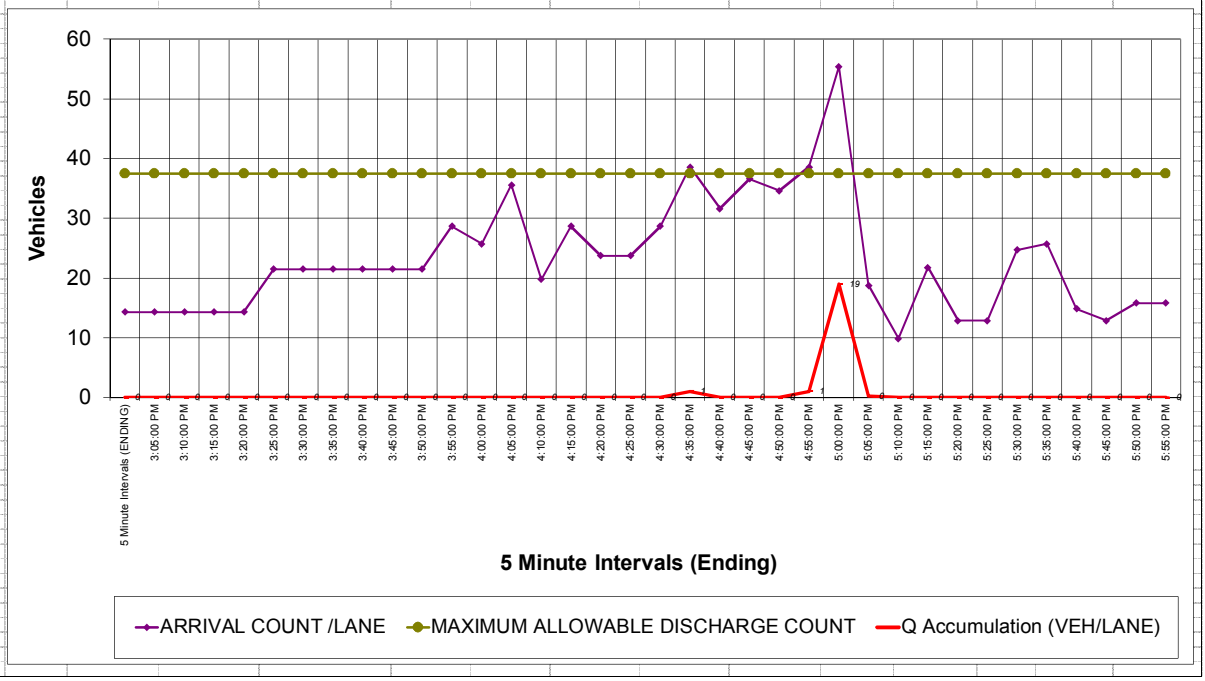
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Short PM Proj

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
3:05:00 PM	10	25	0		115	14	300	-	-	1200	-	-	0	0.0
3:10:00 PM	10	25	0		115	14	300	-	-	1200	-	-	0	0.0
3:15:00 PM	10	25	0		115	14	300	-	-	1200	-	-	0	0.0
3:20:00 PM	10	25	0		115	14	300	-	-	1200	-	-	0	0.0
3:25:00 PM	10	25	0		115	14	300	-	-	1200	-	-	0	0.0
3:30:00 PM	14	25	0		172	22	300	-	-	1200	-	-	0	0.0
3:35:00 PM	14	25	0		172	22	300	-	-	1200	-	-	0	0.0
3:40:00 PM	14	25	0		172	22	300	-	-	1200	-	-	0	0.0
3:45:00 PM	14	25	0		172	22	300	-	-	1200	-	-	0	0.0
3:50:00 PM	14	25	0		172	22	300	-	-	1200	-	-	0	0.0
3:55:00 PM	14	25	0		172	22	300	-	-	1200	-	-	0	0.0
4:00:00 PM	19	25	0		229	29	300	-	-	1200	-	-	0	0.0
4:05:00 PM	17	25	0		206	26	300	-	-	1200	-	-	0	0.0
4:10:00 PM	24	25	0		285	36	300	-	-	1200	-	-	0	0.0
4:15:00 PM	13	25	0		158	20	300	-	-	1200	-	-	0	0.0
4:20:00 PM	19	25	0		229	29	300	-	-	1200	-	-	0	0.0
4:25:00 PM	16	25	0		190	24	300	-	-	1200	-	-	0	0.0
4:30:00 PM	16	25	0		190	24	300	-	-	1200	-	-	0	0.0
4:35:00 PM	19	25	0		229	29	300	-	-	1200	-	-	0	0.0
4:40:00 PM	26	25	1	1	309	39	300	300	-	1200	18	-	26	0.1
4:45:00 PM	21	25	0		253	32	300	-	-	1200	-	-	0	0.0
4:50:00 PM	24	25	0		293	37	300	-	-	1200	-	-	0	0.0
4:55:00 PM	23	25	0		277	35	300	-	-	1200	-	-	0	0.0
5:00:00 PM	26	25	1	1	309	39	300	300	-	1200	18	-	26	0.1
5:05:00 PM	37	25	13	12	443	55	300	550	-	1200	316	-	37	1.1
5:10:00 PM	13	25	0		150	19	300	150	-	1200	4	-	13	0.0
5:15:00 PM	7	25	0		79	10	300	-	-	1200	-	-	0	0.0
5:20:00 PM	15	25	0		174	22	300	-	-	1200	-	-	0	0.0
5:25:00 PM	9	25	0		103	13	300	-	-	1200	-	-	0	0.0
5:30:00 PM	9	25	0		103	13	300	-	-	1200	-	-	0	0.0
5:35:00 PM	16	25	0		198	25	300	-	-	1200	-	-	0	0.0
5:40:00 PM	17	25	0		206	26	300	-	-	1200	-	-	0	0.0
5:45:00 PM	10	25	0		119	15	300	-	-	1200	-	-	0	0.0
5:50:00 PM	9	25	0		103	13	300	-	-	1200	-	-	0	0.0
5:55:00 PM	11	25	0		127	16	300	-	-	1200	-	-	0	0.0
6:00:00 PM	11	25	0		127	16	300	-	-	1200	-	-	0	0.0
	558	900		13		837							101	1.18
		MAX Q (VEH/LN)=	13	MAX RATE (VPH)=	443					MAX Q (FT/LN)=	316	-	37	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				Meter Rate =	300				Avg Delay/veh (hr)=		0.012	
LANES=	1.5	1									Avg Delay/veh (sec)=		42	
Ramp Length=	1200	316	FEET =	96	METERS									
Car Length (ft)=	25	8	METERS											



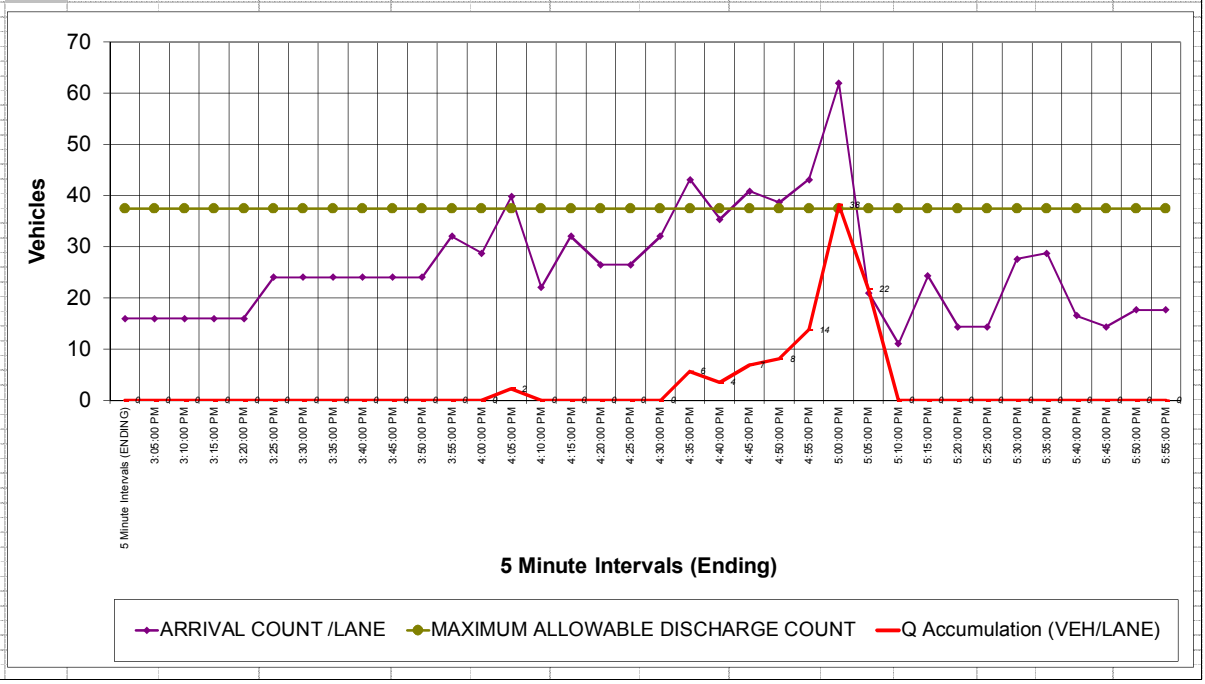
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ 2035 PM

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
3:05:00 PM	14	38	0		172	22	450	-	-	1200	-	-	0	0.0
3:10:00 PM	14	38	0		172	22	450	-	-	1200	-	-	0	0.0
3:15:00 PM	14	38	0		172	22	450	-	-	1200	-	-	0	0.0
3:20:00 PM	14	38	0		172	22	450	-	-	1200	-	-	0	0.0
3:25:00 PM	14	38	0		172	22	450	-	-	1200	-	-	0	0.0
3:30:00 PM	22	38	0		258	32	450	-	-	1200	-	-	0	0.0
3:35:00 PM	22	38	0		258	32	450	-	-	1200	-	-	0	0.0
3:40:00 PM	22	38	0		258	32	450	-	-	1200	-	-	0	0.0
3:45:00 PM	22	38	0		258	32	450	-	-	1200	-	-	0	0.0
3:50:00 PM	22	38	0		258	32	450	-	-	1200	-	-	0	0.0
3:55:00 PM	22	38	0		258	32	450	-	-	1200	-	-	0	0.0
4:00:00 PM	29	38	0		344	43	450	-	-	1200	-	-	0	0.0
4:05:00 PM	26	38	0		309	39	450	-	-	1200	-	-	0	0.0
4:10:00 PM	36	38	0		427	53	450	-	-	1200	-	-	0	0.0
4:15:00 PM	20	38	0		237	30	450	-	-	1200	-	-	0	0.0
4:20:00 PM	29	38	0		344	43	450	-	-	1200	-	-	0	0.0
4:25:00 PM	24	38	0		285	36	450	-	-	1200	-	-	0	0.0
4:30:00 PM	24	38	0		285	36	450	-	-	1200	-	-	0	0.0
4:35:00 PM	29	38	0		344	43	450	-	-	1200	-	-	0	0.0
4:40:00 PM	39	38	1	1	463	58	450	450	-	1200	27	-	39	0.1
4:45:00 PM	32	38	0		380	47	450	-	-	1200	-	-	0	0.0
4:50:00 PM	37	38	0		439	55	450	-	-	1200	-	-	0	0.0
4:55:00 PM	35	38	0		415	52	450	-	-	1200	-	-	0	0.0
5:00:00 PM	39	38	1	1	463	58	450	450	-	1200	27	-	39	0.1
5:05:00 PM	55	38	19	18	664	83	450	850	-	1200	473	-	55	1.6
5:10:00 PM	19	38	0		225	28	450	200	-	1200	6	-	19	0.0
5:15:00 PM	10	38	0		119	15	450	-	-	1200	-	-	0	0.0
5:20:00 PM	22	38	0		261	33	450	-	-	1200	-	-	0	0.0
5:25:00 PM	13	38	0		154	19	450	-	-	1200	-	-	0	0.0
5:30:00 PM	13	38	0		154	19	450	-	-	1200	-	-	0	0.0
5:35:00 PM	25	38	0		297	37	450	-	-	1200	-	-	0	0.0
5:40:00 PM	26	38	0		309	39	450	-	-	1200	-	-	0	0.0
5:45:00 PM	15	38	0		178	22	450	-	-	1200	-	-	0	0.0
5:50:00 PM	13	38	0		154	19	450	-	-	1200	-	-	0	0.0
5:55:00 PM	16	38	0		190	24	450	-	-	1200	-	-	0	0.0
6:00:00 PM	16	38	0		190	24	450	-	-	1200	-	-	0	0.0
	837	1,350		20		1,255							151	1.77
		MAX Q (VEH/LN)=	19	MAX RATE (VPH)=	664					MAX Q (FT/LN)=	473	-	55	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				Meter Rate =	450				Avg Delay/veh (hr)=		0.012	
LANES=	1.5	2									Avg Delay/veh (sec)=		42	
Ramp Length=	1200	473	FEET =	144	METERS									
Car Length (ft)=	25	8	METERS											



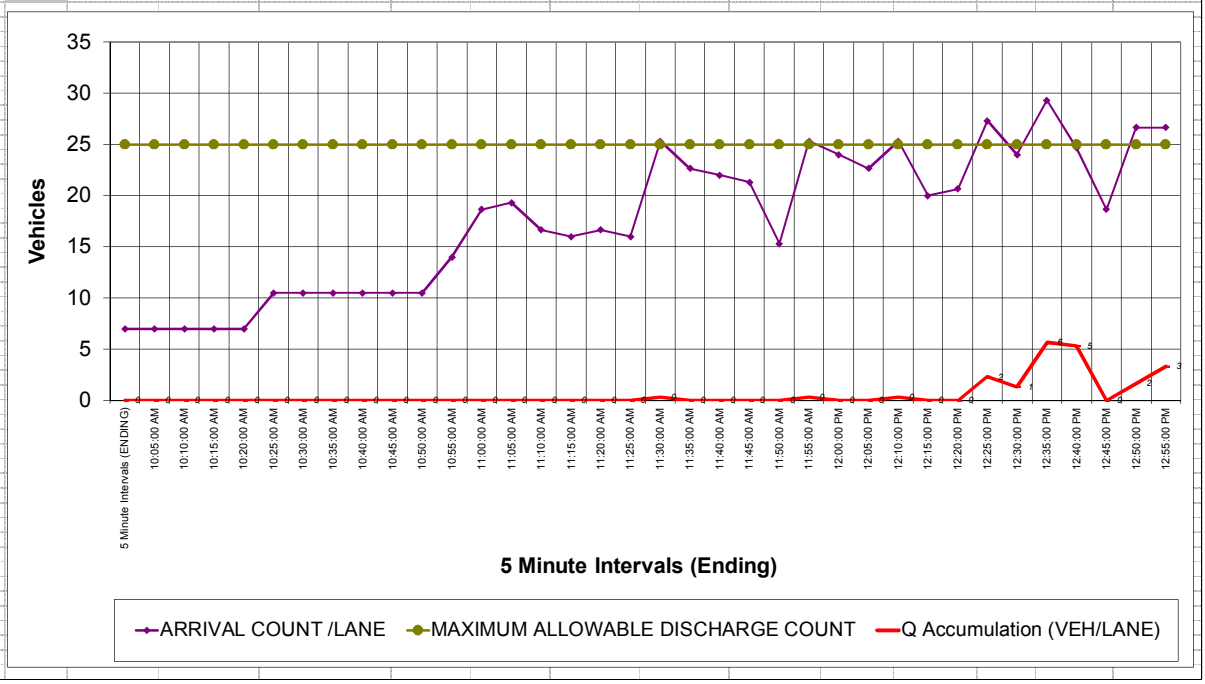
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ 2035 PM Proj

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
3:05:00 PM	16	38	0		192	24	450	-	-	1200	-	-	0	0.0
3:10:00 PM	16	38	0		192	24	450	-	-	1200	-	-	0	0.0
3:15:00 PM	16	38	0		192	24	450	-	-	1200	-	-	0	0.0
3:20:00 PM	16	38	0		192	24	450	-	-	1200	-	-	0	0.0
3:25:00 PM	16	38	0		192	24	450	-	-	1200	-	-	0	0.0
3:30:00 PM	24	38	0		289	36	450	-	-	1200	-	-	0	0.0
3:35:00 PM	24	38	0		289	36	450	-	-	1200	-	-	0	0.0
3:40:00 PM	24	38	0		289	36	450	-	-	1200	-	-	0	0.0
3:45:00 PM	24	38	0		289	36	450	-	-	1200	-	-	0	0.0
3:50:00 PM	24	38	0		289	36	450	-	-	1200	-	-	0	0.0
3:55:00 PM	24	38	0		289	36	450	-	-	1200	-	-	0	0.0
4:00:00 PM	32	38	0		385	48	450	-	-	1200	-	-	0	0.0
4:05:00 PM	29	38	0		345	43	450	-	-	1200	-	-	0	0.0
4:10:00 PM	40	38	2	2	478	60	450	500	-	1200	58	-	40	0.2
4:15:00 PM	22	38	0		265	33	450	-	-	1200	-	-	0	0.0
4:20:00 PM	32	38	0		385	48	450	-	-	1200	-	-	0	0.0
4:25:00 PM	27	38	0		318	40	450	-	-	1200	-	-	0	0.0
4:30:00 PM	27	38	0		318	40	450	-	-	1200	-	-	0	0.0
4:35:00 PM	32	38	0		385	48	450	-	-	1200	-	-	0	0.0
4:40:00 PM	43	38	6	6	518	65	450	550	-	1200	141	-	43	0.5
4:45:00 PM	35	38	4		425	53	450	450	-	1200	88	-	35	0.3
4:50:00 PM	41	38	7	3	491	61	450	550	-	1200	173	-	41	0.6
4:55:00 PM	39	38	8	1	464	58	450	550	-	1200	203	-	39	0.7
5:00:00 PM	43	38	14	6	518	65	450	650	-	1200	344	-	43	1.1
5:05:00 PM	62	38	38	24	743	93	450	1200	-	1200	954	-	62	3.2
5:10:00 PM	21	38	22		252	32	450	500	-	1200	542	-	21	1.8
5:15:00 PM	11	38	0		133	17	450	-	-	1200	-	-	0	0.0
5:20:00 PM	24	38	0		292	36	450	-	-	1200	-	-	0	0.0
5:25:00 PM	14	38	0		173	22	450	-	-	1200	-	-	0	0.0
5:30:00 PM	14	38	0		173	22	450	-	-	1200	-	-	0	0.0
5:35:00 PM	28	38	0		332	41	450	-	-	1200	-	-	0	0.0
5:40:00 PM	29	38	0		345	43	450	-	-	1200	-	-	0	0.0
5:45:00 PM	17	38	0		199	25	450	-	-	1200	-	-	0	0.0
5:50:00 PM	14	38	0		173	22	450	-	-	1200	-	-	0	0.0
5:55:00 PM	18	38	0		212	27	450	-	-	1200	-	-	0	0.0
6:00:00 PM	18	38	0		212	27	450	-	-	1200	-	-	0	0.0
	936	1,350		43		1,403							324	8.34
		MAX Q (VEH/LN)=	38	MAX RATE (VPH)=	743					MAX Q (FT/LN)=	954	-	62	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				Meter Rate =	450				Avg Delay/veh (hr)=		0.026	
LANES=	1.5	2									Avg Delay/veh (sec)=		93	
Ramp Length=	1200	954	FEET =	291	METERS									
Car Length (ft)=	25	8	METERS											



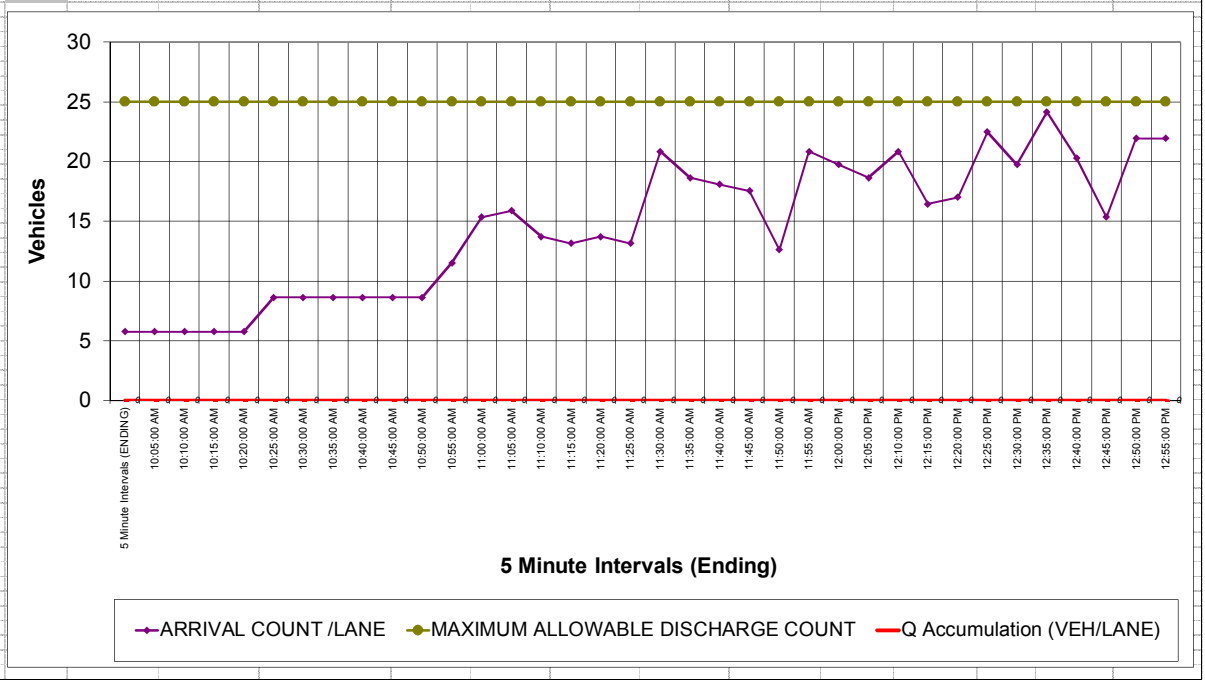
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Exist Sat

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
10:05:00 AM	7	25	0		84	11	300	-	-	1200	-	-	0	0.0
10:10:00 AM	7	25	0		84	11	300	-	-	1200	-	-	0	0.0
10:15:00 AM	7	25	0		84	11	300	-	-	1200	-	-	0	0.0
10:20:00 AM	7	25	0		84	11	300	-	-	1200	-	-	0	0.0
10:25:00 AM	7	25	0		84	11	300	-	-	1200	-	-	0	0.0
10:30:00 AM	11	25	0		126	16	300	-	-	1200	-	-	0	0.0
10:35:00 AM	11	25	0		126	16	300	-	-	1200	-	-	0	0.0
10:40:00 AM	11	25	0		126	16	300	-	-	1200	-	-	0	0.0
10:45:00 AM	11	25	0		126	16	300	-	-	1200	-	-	0	0.0
10:50:00 AM	11	25	0		126	16	300	-	-	1200	-	-	0	0.0
10:55:00 AM	11	25	0		126	16	300	-	-	1200	-	-	0	0.0
11:00:00 AM	14	25	0		168	21	300	-	-	1200	-	-	0	0.0
11:05:00 AM	19	25	0		224	28	300	-	-	1200	-	-	0	0.0
11:10:00 AM	19	25	0		232	29	300	-	-	1200	-	-	0	0.0
11:15:00 AM	17	25	0		200	25	300	-	-	1200	-	-	0	0.0
11:20:00 AM	16	25	0		192	24	300	-	-	1200	-	-	0	0.0
11:25:00 AM	17	25	0		200	25	300	-	-	1200	-	-	0	0.0
11:30:00 AM	16	25	0		192	24	300	-	-	1200	-	-	0	0.0
11:35:00 AM	25	25	0	0	304	38	300	300	-	1200	8	-	25	0.0
11:40:00 AM	23	25	0		272	34	300	-	-	1200	-	-	0	0.0
11:45:00 AM	22	25	0		264	33	300	-	-	1200	-	-	0	0.0
11:50:00 AM	21	25	0		256	32	300	-	-	1200	-	-	0	0.0
11:55:00 AM	15	25	0		184	23	300	-	-	1200	-	-	0	0.0
12:00:00 PM	25	25	0	0	304	38	300	300	-	1200	8	-	25	0.0
12:05:00 PM	24	25	0		288	36	300	-	-	1200	-	-	0	0.0
12:10:00 PM	23	25	0		272	34	300	-	-	1200	-	-	0	0.0
12:15:00 PM	25	25	0	0	304	38	300	300	-	1200	8	-	25	0.0
12:20:00 PM	20	25	0		240	30	300	-	-	1200	-	-	0	0.0
12:25:00 PM	21	25	0		248	31	300	-	-	1200	-	-	0	0.0
12:30:00 PM	27	25	2	2	328	41	300	350	-	1200	58	-	27	0.2
12:35:00 PM	24	25	1		288	36	300	300	-	1200	33	-	24	0.1
12:40:00 PM	29	25	6	4	352	44	300	400	-	1200	142	-	29	0.5
12:45:00 PM	25	25	5		296	37	300	350	-	1200	133	-	25	0.4
12:50:00 PM	19	25	0		224	28	300	-	-	1200	-	-	0	0.0
12:55:00 PM	27	25	2	2	320	40	300	300	-	1200	42	-	27	0.1
1:00:00 PM	27	25	3	2	320	40	300	350	-	1200	83	-	27	0.3
	637	**900**		**11**		**956**							**235**	**1.72**
		MAX Q (VEH/LN)=	**6**	**MAX RATE (VPH)=**	**352**					**MAX Q (FT/LN)=**	**142**	**-**	**29**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**300**				Avg Delay/veh (hr)=		0.007	
LANES=	**1.5**	1									**Avg Delay/veh (sec)=**		**26**	
Ramp Length=	1200	142	FEET =	43	METERS									
Car Length (ft)=	25	8	METERS											



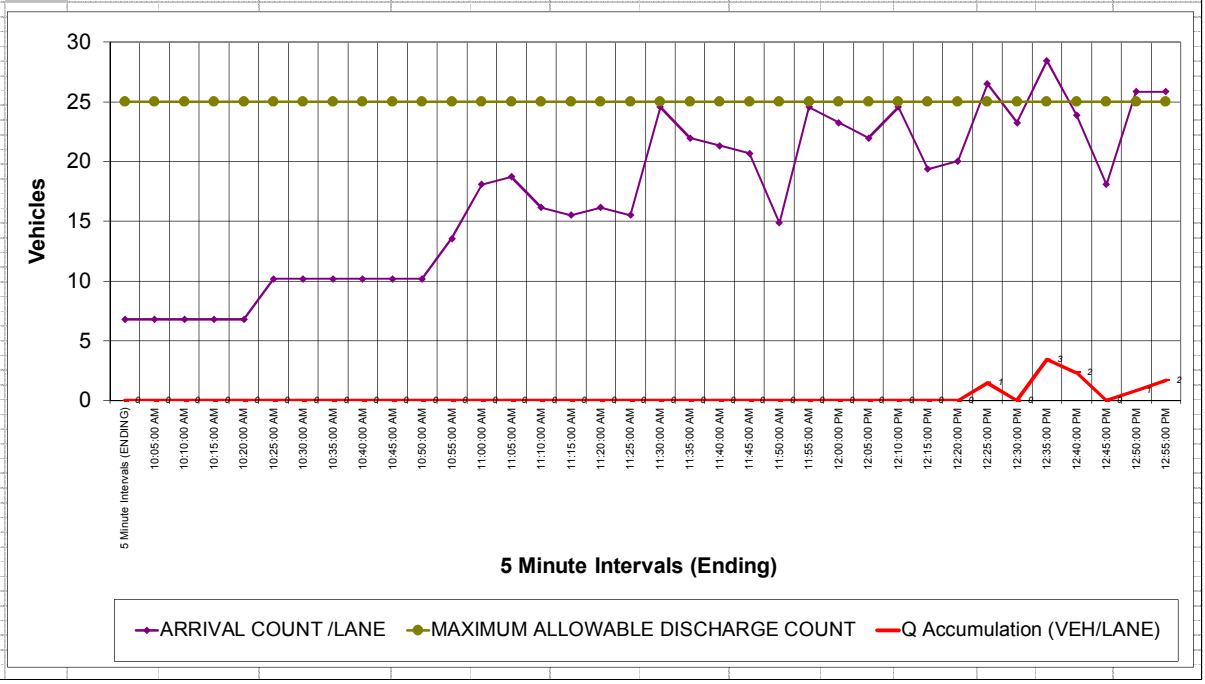
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Short Sat

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
10:05:00 AM	6	25	0		69	9	300	-	-	1200	-	-	0	0.0
10:10:00 AM	6	25	0		69	9	300	-	-	1200	-	-	0	0.0
10:15:00 AM	6	25	0		69	9	300	-	-	1200	-	-	0	0.0
10:20:00 AM	6	25	0		69	9	300	-	-	1200	-	-	0	0.0
10:25:00 AM	6	25	0		69	9	300	-	-	1200	-	-	0	0.0
10:30:00 AM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
10:35:00 AM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
10:40:00 AM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
10:45:00 AM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
10:50:00 AM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
10:55:00 AM	9	25	0		104	13	300	-	-	1200	-	-	0	0.0
11:00:00 AM	12	25	0		138	17	300	-	-	1200	-	-	0	0.0
11:05:00 AM	15	25	0		184	23	300	-	-	1200	-	-	0	0.0
11:10:00 AM	16	25	0		191	24	300	-	-	1200	-	-	0	0.0
11:15:00 AM	14	25	0		165	21	300	-	-	1200	-	-	0	0.0
11:20:00 AM	13	25	0		158	20	300	-	-	1200	-	-	0	0.0
11:25:00 AM	14	25	0		165	21	300	-	-	1200	-	-	0	0.0
11:30:00 AM	13	25	0		158	20	300	-	-	1200	-	-	0	0.0
11:35:00 AM	21	25	0		250	31	300	-	-	1200	-	-	0	0.0
11:40:00 AM	19	25	0		224	28	300	-	-	1200	-	-	0	0.0
11:45:00 AM	18	25	0		217	27	300	-	-	1200	-	-	0	0.0
11:50:00 AM	18	25	0		211	26	300	-	-	1200	-	-	0	0.0
11:55:00 AM	13	25	0		151	19	300	-	-	1200	-	-	0	0.0
12:00:00 PM	21	25	0		250	31	300	-	-	1200	-	-	0	0.0
12:05:00 PM	20	25	0		237	30	300	-	-	1200	-	-	0	0.0
12:10:00 PM	19	25	0		224	28	300	-	-	1200	-	-	0	0.0
12:15:00 PM	21	25	0		250	31	300	-	-	1200	-	-	0	0.0
12:20:00 PM	16	25	0		197	25	300	-	-	1200	-	-	0	0.0
12:25:00 PM	17	25	0		204	26	300	-	-	1200	-	-	0	0.0
12:30:00 PM	22	25	0		270	34	300	-	-	1200	-	-	0	0.0
12:35:00 PM	20	25	0		237	30	300	-	-	1200	-	-	0	0.0
12:40:00 PM	24	25	0		290	36	300	-	-	1200	-	-	0	0.0
12:45:00 PM	20	25	0		244	30	300	-	-	1200	-	-	0	0.0
12:50:00 PM	15	25	0		184	23	300	-	-	1200	-	-	0	0.0
12:55:00 PM	22	25	0		263	33	300	-	-	1200	-	-	0	0.0
1:00:00 PM	22	25	0		263	33	300	-	-	1200	-	-	0	0.0
	524	**900**		**-**		**787**							**-**	**0.00**
		MAX Q (VEH/LN)=	**-**	**MAX RATE (VPH)=**	**290**					**MAX Q (FT/LN)=**	**-**	**-**	**-**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**300**				Avg Delay/veh (hr)=		#DIV/0!	
LANES=	**1.5**	1					5	vps/lane			**Avg Delay/veh (sec)=**		**#DIV/0!**	
Ramp Length=	1200	-	FEET =	-	METERS									
Car Length (ft)=	25	8	METERS											



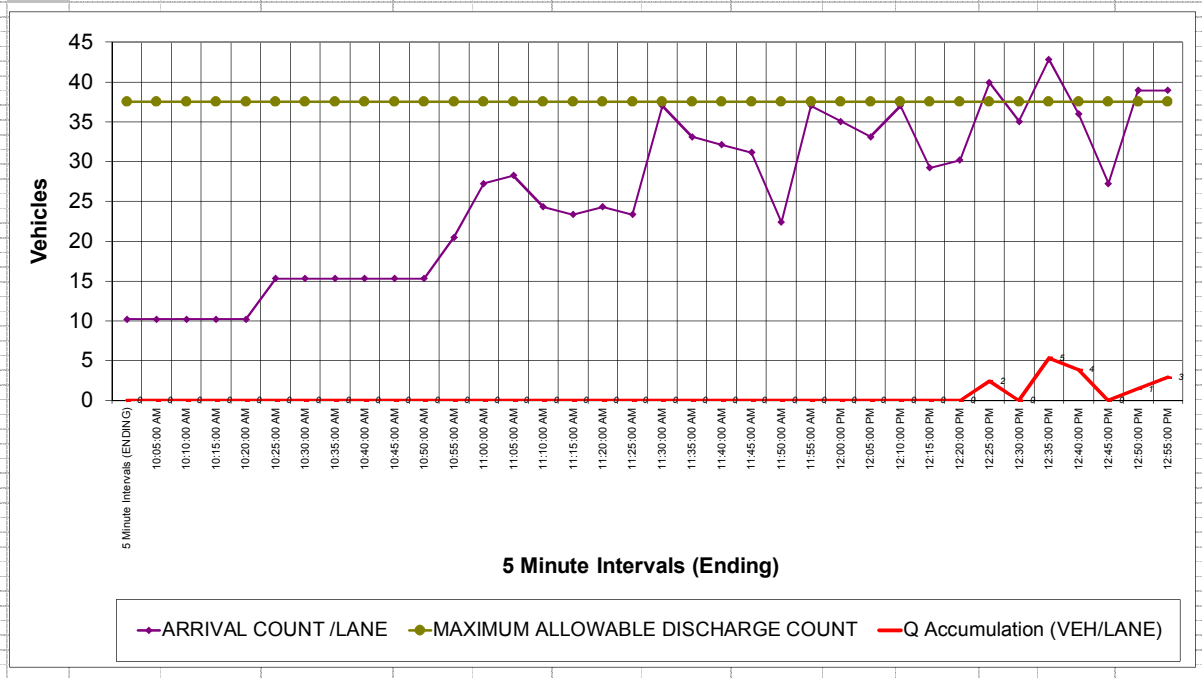
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ Short Sat Proj

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
10:05:00 AM	7	25	0		81	10	300	-	-	1200	-	-	0	0.0
10:10:00 AM	7	25	0		81	10	300	-	-	1200	-	-	0	0.0
10:15:00 AM	7	25	0		81	10	300	-	-	1200	-	-	0	0.0
10:20:00 AM	7	25	0		81	10	300	-	-	1200	-	-	0	0.0
10:25:00 AM	7	25	0		81	10	300	-	-	1200	-	-	0	0.0
10:30:00 AM	10	25	0		122	15	300	-	-	1200	-	-	0	0.0
10:35:00 AM	10	25	0		122	15	300	-	-	1200	-	-	0	0.0
10:40:00 AM	10	25	0		122	15	300	-	-	1200	-	-	0	0.0
10:45:00 AM	10	25	0		122	15	300	-	-	1200	-	-	0	0.0
10:50:00 AM	10	25	0		122	15	300	-	-	1200	-	-	0	0.0
10:55:00 AM	10	25	0		122	15	300	-	-	1200	-	-	0	0.0
11:00:00 AM	14	25	0		163	20	300	-	-	1200	-	-	0	0.0
11:05:00 AM	18	25	0		217	27	300	-	-	1200	-	-	0	0.0
11:10:00 AM	19	25	0		225	28	300	-	-	1200	-	-	0	0.0
11:15:00 AM	16	25	0		194	24	300	-	-	1200	-	-	0	0.0
11:20:00 AM	16	25	0		186	23	300	-	-	1200	-	-	0	0.0
11:25:00 AM	16	25	0		194	24	300	-	-	1200	-	-	0	0.0
11:30:00 AM	16	25	0		186	23	300	-	-	1200	-	-	0	0.0
11:35:00 AM	25	25	0		295	37	300	-	-	1200	-	-	0	0.0
11:40:00 AM	22	25	0		264	33	300	-	-	1200	-	-	0	0.0
11:45:00 AM	21	25	0		256	32	300	-	-	1200	-	-	0	0.0
11:50:00 AM	21	25	0		248	31	300	-	-	1200	-	-	0	0.0
11:55:00 AM	15	25	0		178	22	300	-	-	1200	-	-	0	0.0
12:00:00 PM	25	25	0		295	37	300	-	-	1200	-	-	0	0.0
12:05:00 PM	23	25	0		279	35	300	-	-	1200	-	-	0	0.0
12:10:00 PM	22	25	0		264	33	300	-	-	1200	-	-	0	0.0
12:15:00 PM	25	25	0		295	37	300	-	-	1200	-	-	0	0.0
12:20:00 PM	19	25	0		233	29	300	-	-	1200	-	-	0	0.0
12:25:00 PM	20	25	0		240	30	300	-	-	1200	-	-	0	0.0
12:30:00 PM	26	25	1	1	318	40	300	300	-	1200	37	-	26	0.1
12:35:00 PM	23	25	0		279	35	300	-	-	1200	-	-	0	0.0
12:40:00 PM	28	25	3	3	341	43	300	350	-	1200	86	-	28	0.3
12:45:00 PM	24	25	2		287	36	300	300	-	1200	59	-	24	0.2
12:50:00 PM	18	25	0		217	27	300	-	-	1200	-	-	0	0.0
12:55:00 PM	26	25	1	1	310	39	300	300	-	1200	21	-	26	0.1
1:00:00 PM	26	25	2	1	310	39	300	300	-	1200	43	-	26	0.1
	618	**900**		**7**		**927**							**131**	**0.82**
		MAX Q (VEH/LN)=	**3**	**MAX RATE (VPH)=**	**341**					**MAX Q (FT/LN)=**	**86**	**-**	**28**	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				**Meter Rate =**	**300**				Avg Delay/veh (hr)=		0.006	
LANES=	**1.5**	1					5	vps/lane			**Avg Delay/veh (sec)=**		**23**	
Ramp Length=	1200	86	FEET =	26	METERS									
Car Length (ft)=	25	8	METERS											



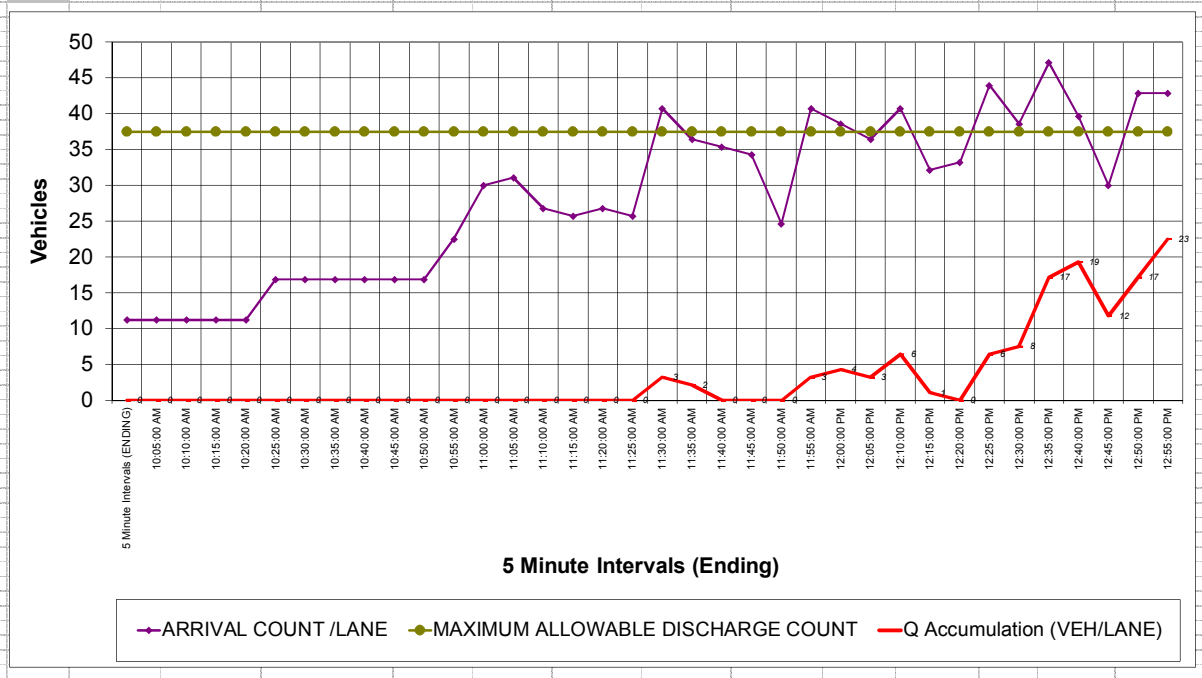
I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ 2035 Sat

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
10:05:00 AM	10	38	0		123	15	450	-	-	1200	-	-	0	0.0
10:10:00 AM	10	38	0		123	15	450	-	-	1200	-	-	0	0.0
10:15:00 AM	10	38	0		123	15	450	-	-	1200	-	-	0	0.0
10:20:00 AM	10	38	0		123	15	450	-	-	1200	-	-	0	0.0
10:25:00 AM	10	38	0		123	15	450	-	-	1200	-	-	0	0.0
10:30:00 AM	15	38	0		184	23	450	-	-	1200	-	-	0	0.0
10:35:00 AM	15	38	0		184	23	450	-	-	1200	-	-	0	0.0
10:40:00 AM	15	38	0		184	23	450	-	-	1200	-	-	0	0.0
10:45:00 AM	15	38	0		184	23	450	-	-	1200	-	-	0	0.0
10:50:00 AM	15	38	0		184	23	450	-	-	1200	-	-	0	0.0
10:55:00 AM	15	38	0		184	23	450	-	-	1200	-	-	0	0.0
11:00:00 AM	20	38	0		245	31	450	-	-	1200	-	-	0	0.0
11:05:00 AM	27	38	0		327	41	450	-	-	1200	-	-	0	0.0
11:10:00 AM	28	38	0		339	42	450	-	-	1200	-	-	0	0.0
11:15:00 AM	24	38	0		292	37	450	-	-	1200	-	-	0	0.0
11:20:00 AM	23	38	0		280	35	450	-	-	1200	-	-	0	0.0
11:25:00 AM	24	38	0		292	37	450	-	-	1200	-	-	0	0.0
11:30:00 AM	23	38	0		280	35	450	-	-	1200	-	-	0	0.0
11:35:00 AM	37	38	0		444	55	450	-	-	1200	-	-	0	0.0
11:40:00 AM	33	38	0		397	50	450	-	-	1200	-	-	0	0.0
11:45:00 AM	32	38	0		386	48	450	-	-	1200	-	-	0	0.0
11:50:00 AM	31	38	0		374	47	450	-	-	1200	-	-	0	0.0
11:55:00 AM	22	38	0		269	34	450	-	-	1200	-	-	0	0.0
12:00:00 PM	37	38	0		444	55	450	-	-	1200	-	-	0	0.0
12:05:00 PM	35	38	0		421	53	450	-	-	1200	-	-	0	0.0
12:10:00 PM	33	38	0		397	50	450	-	-	1200	-	-	0	0.0
12:15:00 PM	37	38	0		444	55	450	-	-	1200	-	-	0	0.0
12:20:00 PM	29	38	0		351	44	450	-	-	1200	-	-	0	0.0
12:25:00 PM	30	38	0		362	45	450	-	-	1200	-	-	0	0.0
12:30:00 PM	40	38	2	2	479	60	450	500	-	1200	60	-	40	0.2
12:35:00 PM	35	38	0		421	53	450	-	-	1200	-	-	0	0.0
12:40:00 PM	43	38	5	5	514	64	450	550	-	1200	134	-	43	0.4
12:45:00 PM	36	38	4		432	54	450	450	-	1200	97	-	36	0.3
12:50:00 PM	27	38	0		327	41	450	-	-	1200	-	-	0	0.0
12:55:00 PM	39	38	1	1	467	58	450	450	-	1200	36	-	39	0.1
1:00:00 PM	39	38	3	1	467	58	450	500	-	1200	72	-	39	0.2
	931	1,350		11		1,396							197	1.33
		MAX Q (VEH/LN)=	5	MAX RATE (VPH)=	514					MAX Q (FT/LN)=	134	-	43	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				Meter Rate =	450				Avg Delay/veh (hr)=		0.007	
LANES=	1.5	2					7.5	vps/lane			Avg Delay/veh (sec)=		24	
Ramp Length=	1200	134	FEET =	41	METERS									
Car Length (ft)=	25	8	METERS											



I-15/Clinton Keith Road Interchange Project
Ramp Metering Analysis
WB On_ 2035 Sat Proj

5 Minute Intervals (ENDING)	ARRIVAL COUNT /LANE	MAXIMUM ALLOWABLE DISCHARGE COUNT	Q Accumulation (VEH/LANE)	INSTANTANEOUS ADDITIONAL Q	ARRIVAL RATE/LANE	TOTAL ARRIVAL COUNT	MAXIMUM ALLOWABLE DISCHARGE RATE/LANE	SUGGESTED METER RATE (to prevent Qs)	SUGGESTED METER RATE (to prevent Storage Overflow)	Ramp Storage Provided (ft/Lane)	Queue/Lane (FT/Lane)	Storage Overflow (ft)	Total Vehicles Delayed	Delay (veh-hr)
10:05:00 AM	11	38	0		135	17	450	-	-	1200	-	-	0	0.0
10:10:00 AM	11	38	0		135	17	450	-	-	1200	-	-	0	0.0
10:15:00 AM	11	38	0		135	17	450	-	-	1200	-	-	0	0.0
10:20:00 AM	11	38	0		135	17	450	-	-	1200	-	-	0	0.0
10:25:00 AM	11	38	0		135	17	450	-	-	1200	-	-	0	0.0
10:30:00 AM	17	38	0		203	25	450	-	-	1200	-	-	0	0.0
10:35:00 AM	17	38	0		203	25	450	-	-	1200	-	-	0	0.0
10:40:00 AM	17	38	0		203	25	450	-	-	1200	-	-	0	0.0
10:45:00 AM	17	38	0		203	25	450	-	-	1200	-	-	0	0.0
10:50:00 AM	17	38	0		203	25	450	-	-	1200	-	-	0	0.0
10:55:00 AM	17	38	0		203	25	450	-	-	1200	-	-	0	0.0
11:00:00 AM	23	38	0		270	34	450	-	-	1200	-	-	0	0.0
11:05:00 AM	30	38	0		360	45	450	-	-	1200	-	-	0	0.0
11:10:00 AM	31	38	0		373	47	450	-	-	1200	-	-	0	0.0
11:15:00 AM	27	38	0		321	40	450	-	-	1200	-	-	0	0.0
11:20:00 AM	26	38	0		309	39	450	-	-	1200	-	-	0	0.0
11:25:00 AM	27	38	0		321	40	450	-	-	1200	-	-	0	0.0
11:30:00 AM	26	38	0		309	39	450	-	-	1200	-	-	0	0.0
11:35:00 AM	41	38	3	3	489	61	450	500	-	1200	80	-	41	0.3
11:40:00 AM	36	38	2		437	55	450	450	-	1200	54	-	36	0.2
11:45:00 AM	35	38	0		424	53	450	-	-	1200	-	-	0	0.0
11:50:00 AM	34	38	0		411	51	450	-	-	1200	-	-	0	0.0
11:55:00 AM	25	38	0		296	37	450	-	-	1200	-	-	0	0.0
12:00:00 PM	41	38	3	3	489	61	450	500	-	1200	80	-	41	0.3
12:05:00 PM	39	38	4	1	463	58	450	500	-	1200	107	-	39	0.4
12:10:00 PM	36	38	3		437	55	450	450	-	1200	80	-	36	0.3
12:15:00 PM	41	38	6	3	489	61	450	550	-	1200	161	-	41	0.5
12:20:00 PM	32	38	1		386	48	450	350	-	1200	27	-	32	0.1
12:25:00 PM	33	38	0		399	50	450	-	-	1200	-	-	0	0.0
12:30:00 PM	44	38	6	6	527	66	450	600	-	1200	161	-	44	0.5
12:35:00 PM	39	38	8	1	463	58	450	550	-	1200	188	-	39	0.6
12:40:00 PM	47	38	17	10	566	71	450	750	-	1200	429	-	47	1.4
12:45:00 PM	40	38	19	2	476	59	450	700	-	1200	482	-	40	1.6
12:50:00 PM	30	38	12		360	45	450	500	-	1200	295	-	30	1.0
12:55:00 PM	43	38	17	5	514	64	450	700	-	1200	429	-	43	1.4
1:00:00 PM	43	38	23	5	514	64	450	750	-	1200	563	-	43	1.9
	1,024	1,350		41		1,536							551	10.45
		MAX Q (VEH/LN)=	23	MAX RATE (VPH)=	566					MAX Q (FT/LN)=	563	-	47	
						(Min=240, Max=900vph/lane)								
	INPUT	Suggested				Meter Rate =	450				Avg Delay/veh (hr)=		0.019	
LANES=	1.5	2					7.5	vps/lane			Avg Delay/veh (sec)=		68	
Ramp Length=	1200	563	FEET =	171	METERS									
Car Length (ft)=	25	8	METERS											



Appendix J: Signal Warrants

Intersection 26

Sierra College Boulevard/SR-193

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Existing Plus Project Conditions – Weekday PM Peak Hour**

Intersection: **Sierra College Boulevard/SR193**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

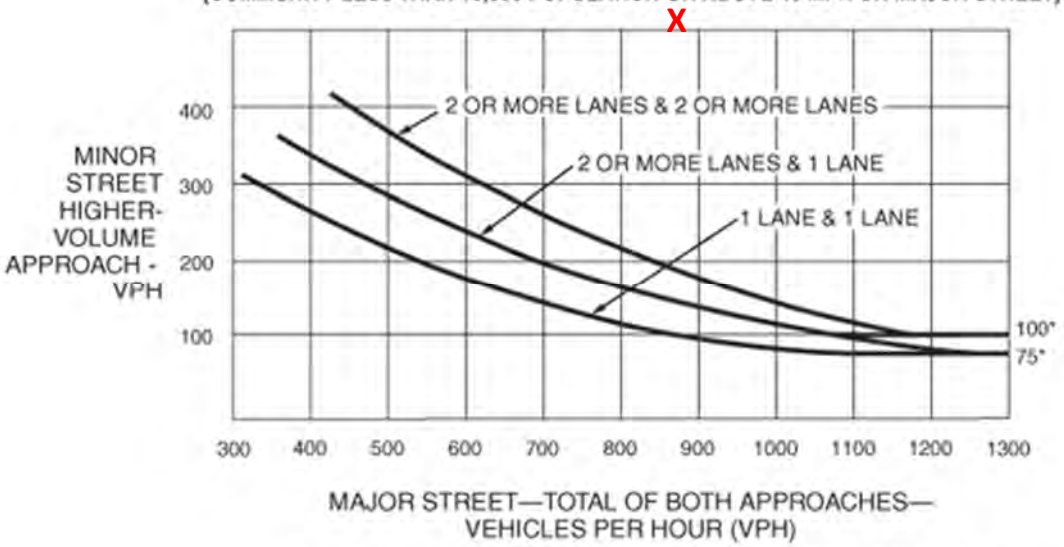
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	876
Highest Approaches – Minor Street	1	626

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday PM Peak Hour**

Intersection: **Sierra College Boulevard/SR193**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

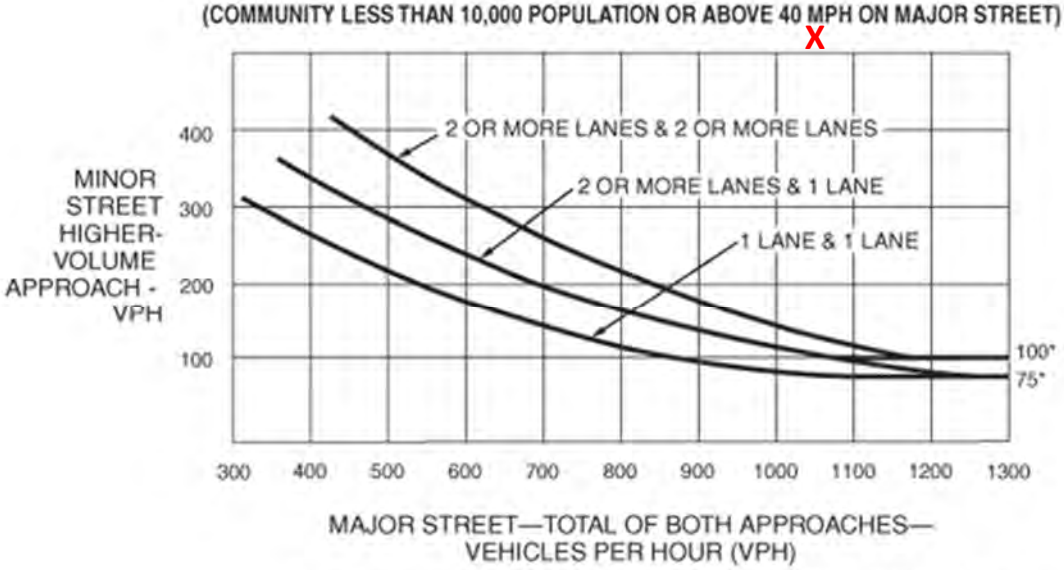
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1057
Highest Approaches – Minor Street	1	761

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Sierra College Boulevard/SR193**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

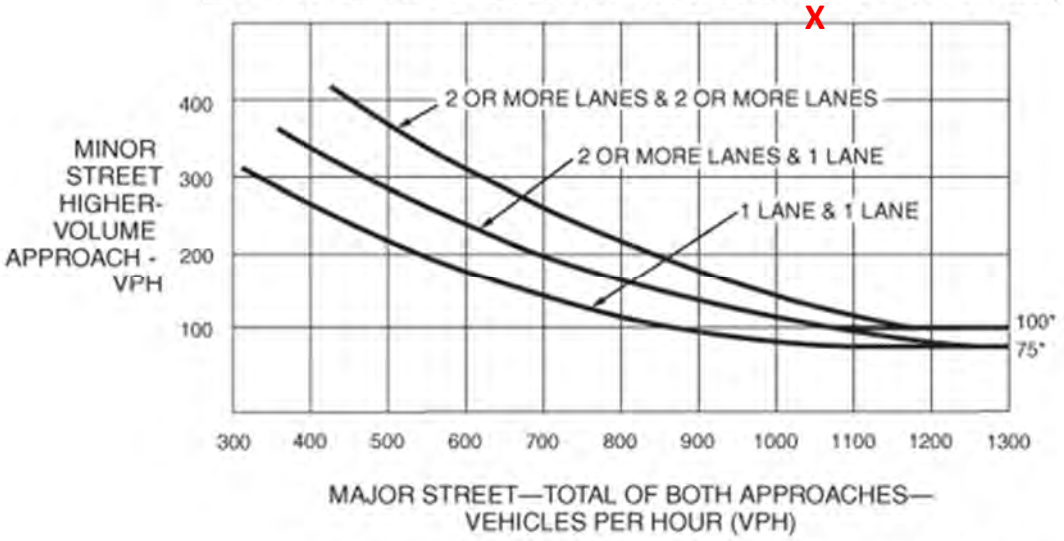
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1068
Highest Approaches – Minor Street	1	518

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Intersection 27

Sierra College Boulevard/English Colony Way

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday PM Peak Hour**

Intersection: **Sierra College Boulevard/English Colony Way**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

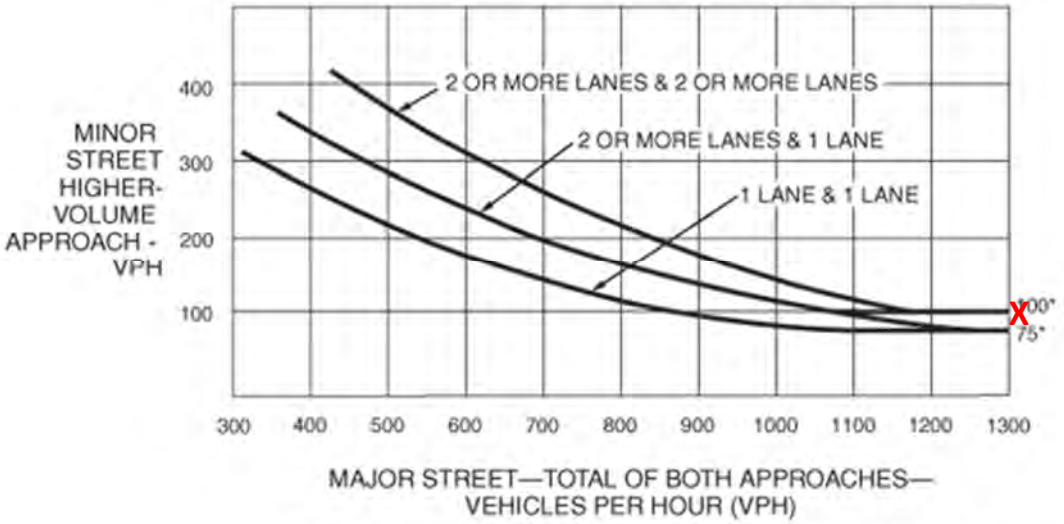
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1916
Highest Approaches – Minor Street	1	97

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Sierra College Boulevard/SR193**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

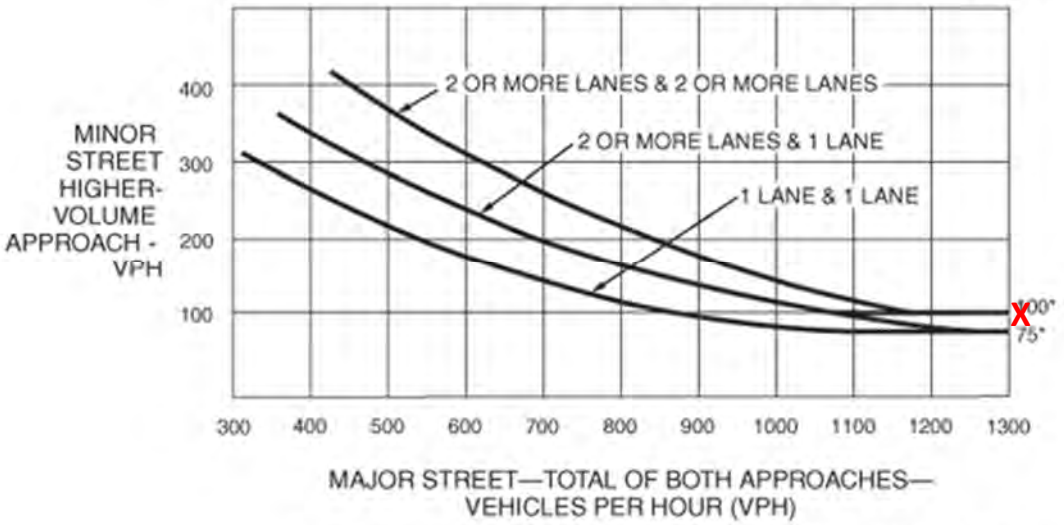
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1482
Highest Approaches – Minor Street	1	91

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Intersection 28

Sierra College Boulevard/Delmar Avenue

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Existing Plus Project Conditions – Weekday PM Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

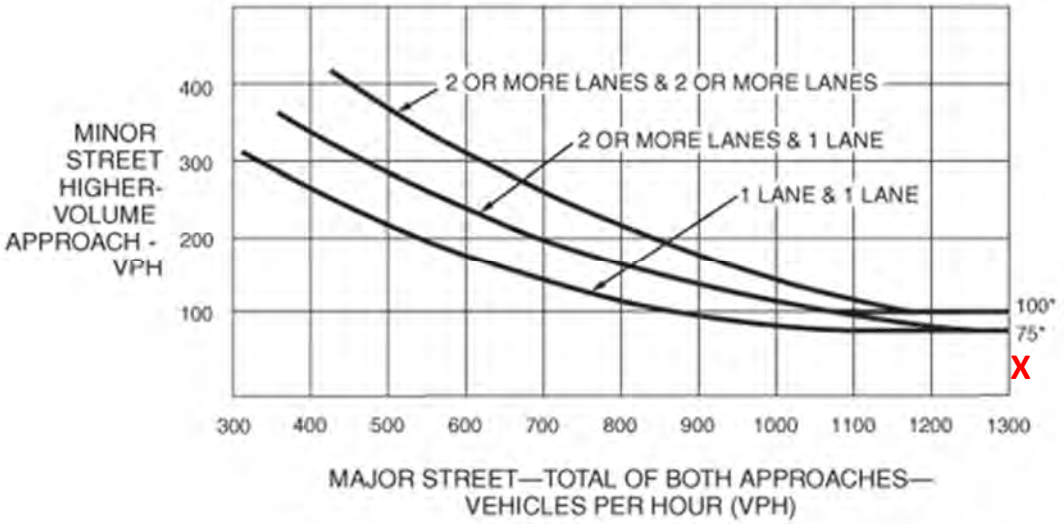
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1353
Highest Approaches – Minor Street	1	39

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Existing Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

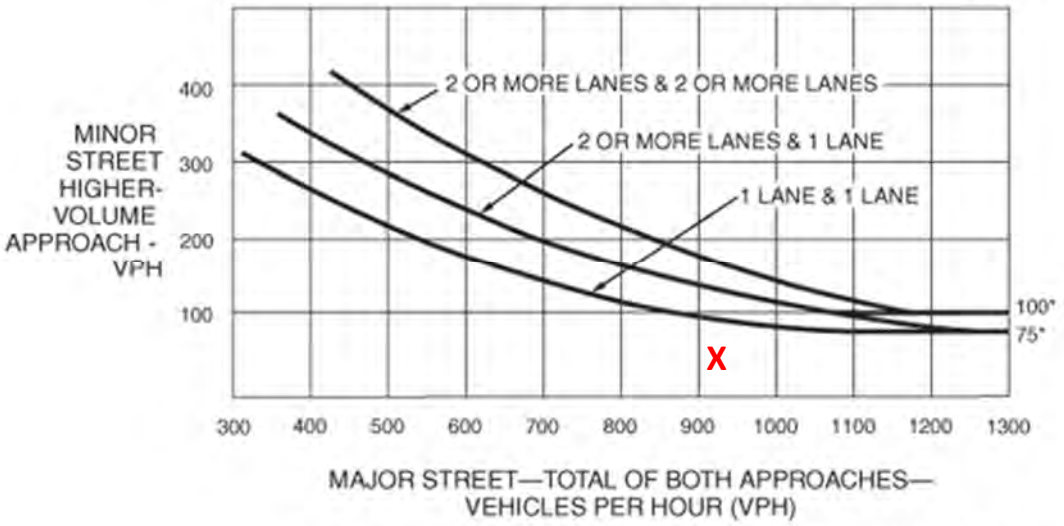
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	925
Highest Approaches – Minor Street	1	50

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday AM Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

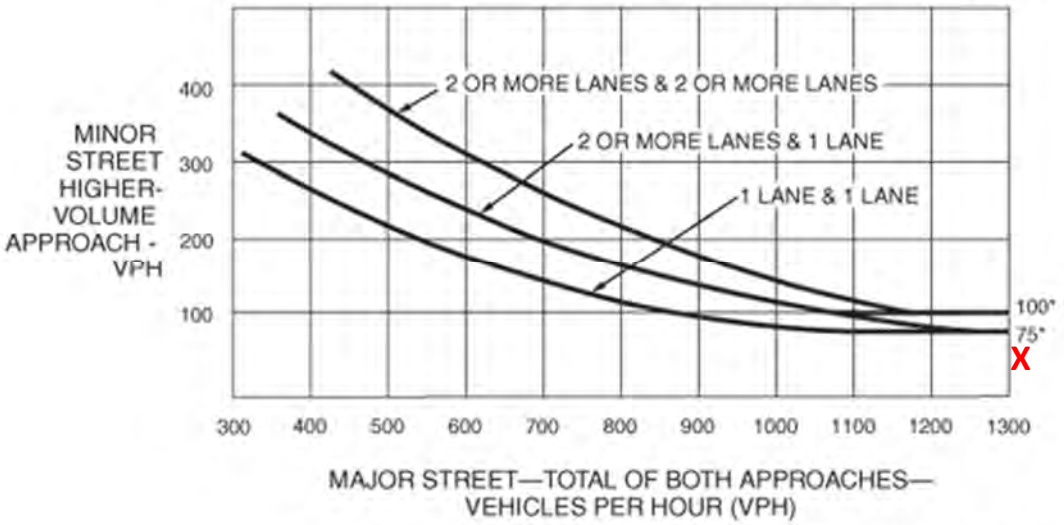
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1467
Highest Approaches – Minor Street	1	45

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday PM Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

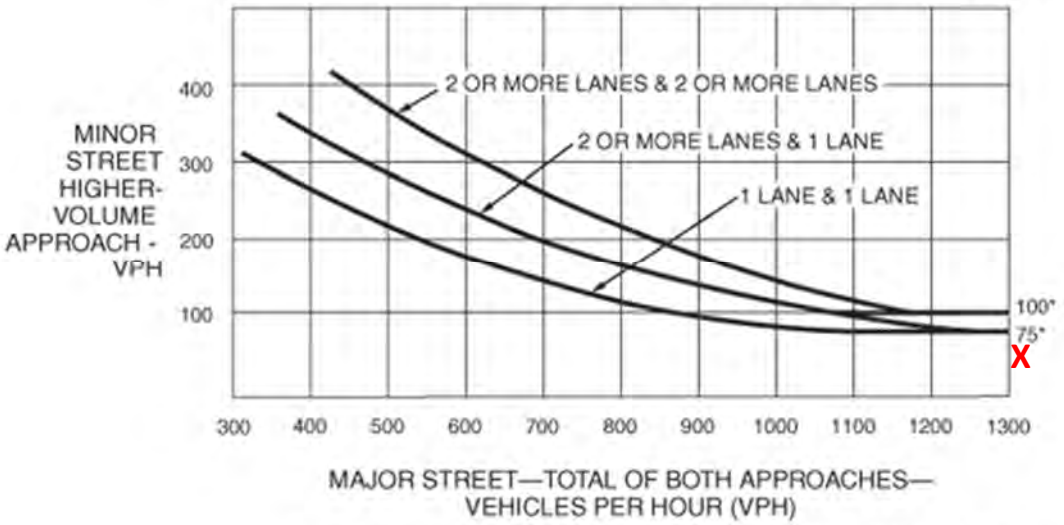
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1917
Highest Approaches – Minor Street	1	57

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

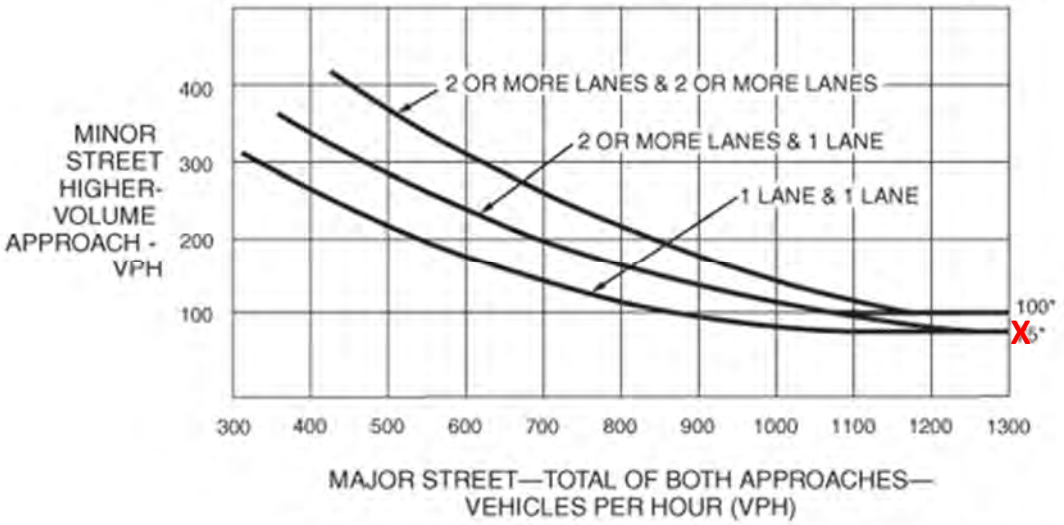
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	1550
Highest Approaches – Minor Street	1	75

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Long Term Plus Project Conditions – Weekday PM Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☒ NO ☐
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

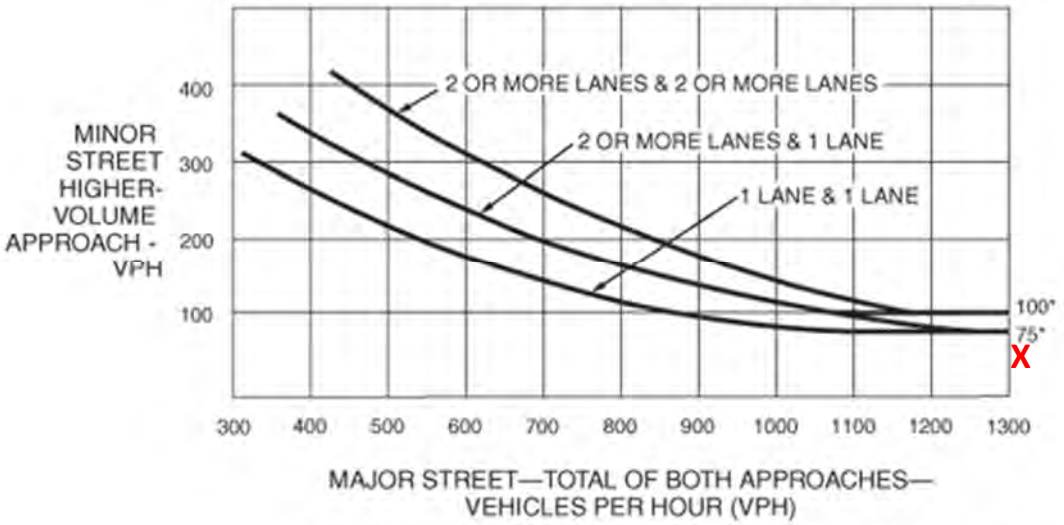
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	3552
Highest Approaches – Minor Street	1	52

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Long Term Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Sierra College Boulevard/Delmar Avenue**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☐ NO ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

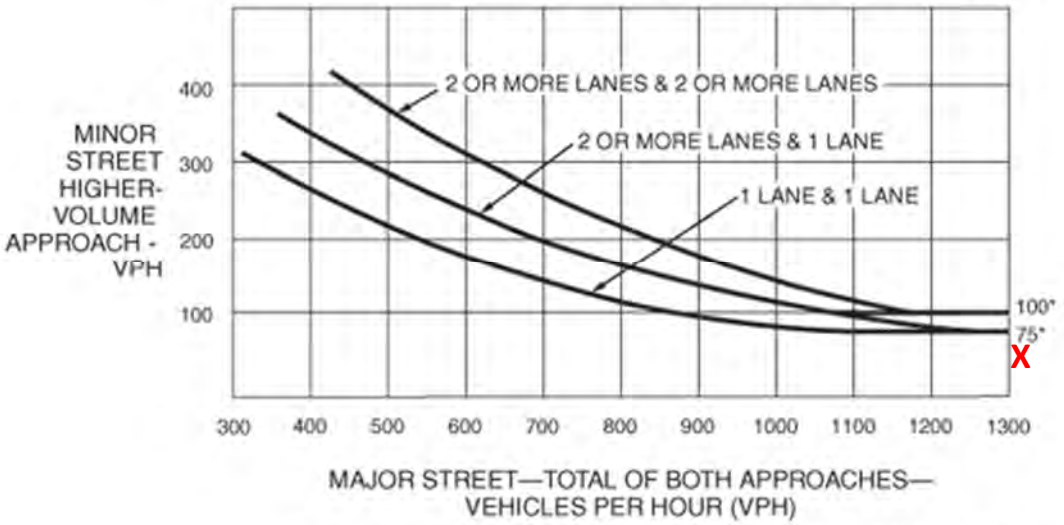
PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	2648
Highest Approaches – Minor Street	1	49

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Intersection 29

Taylor Road/English Colony Way

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Taylor Road/English Colony Way**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

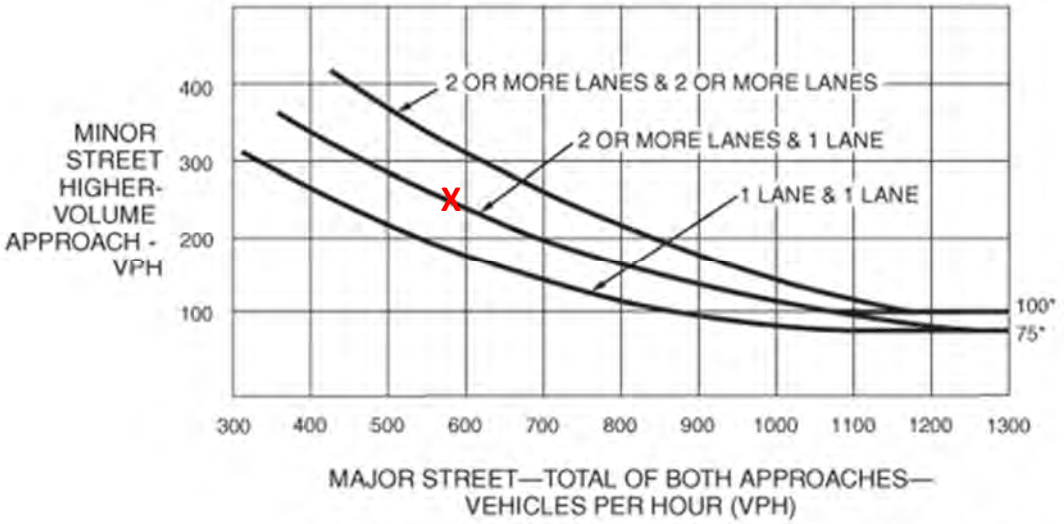
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	580
Highest Approaches – Minor Street	1	246

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Intersection 31

Taylor Road/Penryn Road (South)

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Existing Plus Project Conditions – Weekday AM Peak Hour**

Intersection: **Taylor Road/Penryn Road (South)**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

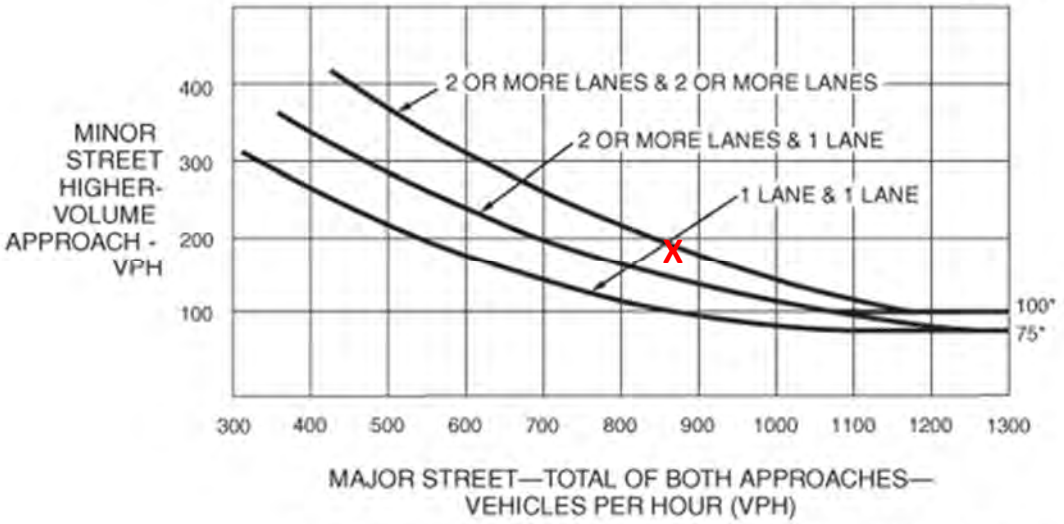
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	874
Highest Approaches – Minor Street	1	193

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Short Term Plus Project Conditions – Weekday AM Peak Hour**

Intersection: **Taylor Road/Penryn Road (South)**

PART A or PART B SATISFIED YES ☒ NO ☐

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

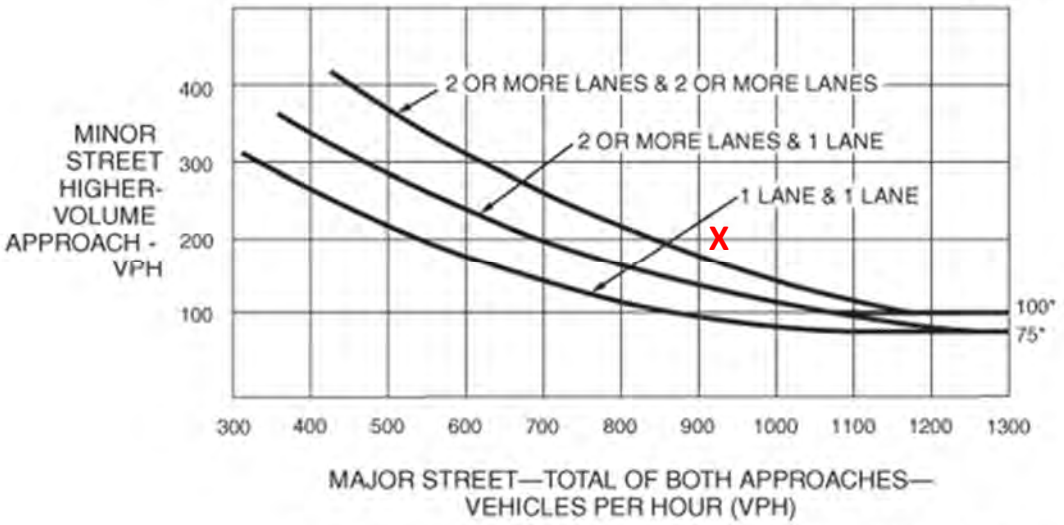
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	924
Highest Approaches – Minor Street	1	200

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-4.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Intersection 36

Taylor Road/Webb Street

Traffic Signal Warrants Worksheet

MUTCD Warrant 3: Peak Hour

Scenario: **Existing Plus Project Conditions – Weekday MD Peak Hour**

Intersection: **Taylor Road/Webb Street**

PART A or PART B SATISFIED YES ☐ NO ☒

PART A SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied)

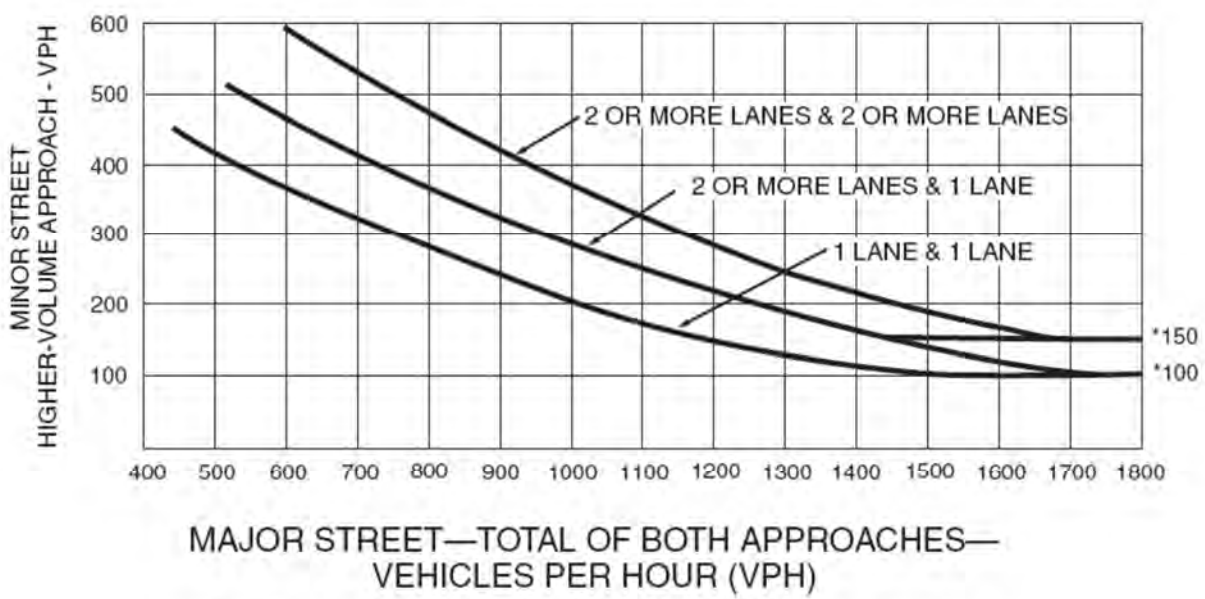
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES ☐ NO ☒
2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — YES ☒ NO ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — YES ☒ NO ☐

PART B SATISFIED YES ☐ NO ☒

APPROACH LANES	Lanes	VPH
Both Approaches – Major Street	1	675
Highest Approaches – Minor Street	1	149

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume minor street approach (one direction only) for one hour (any consecutive 15 minute period) fall above the applicable curves in MUTCD Figure 4C-3.

Figure 4C-3.Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Appendix F Cultural Resources Inventory

Town of Loomis Costco Warehouse

Cultural Resources Inventory Report

Placer County, California

Prepared for:
Town of Loomis
Planning Department
3665 Taylor Road
Loomis, CA 95650

AECOM

January 2018

Town of Loomis Costco Warehouse

Cultural Resources Inventory Report

Placer County, California

Prepared for:

Town of Loomis
Planning Department
3665 Taylor Road
Loomis, CA 95650

Prepared by:

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Contact:

A.J. Jordan
916.361.6449

AECOM

January 2018

MANAGEMENT SUMMARY

AECOM was contracted by the Town of Loomis Planning Department to conduct a cultural resources inventory as part of an Environmental Impact Report (EIR) for the construction of a Costco Warehouse and associated facilities in Loomis, California. The project is located in the Town of Loomis, Placer County, on the Rocklin U.S. Geological Survey 7.5-minute topographic quad and Township 11N Range 7E Section 16.

No cultural resources inventories had been previously conducted within the project area; 17 cultural resources inventories conducted within 0.25 mile of the project area identified three prehistoric bedrock milling features and six historic resources, generally related to mining. Pursuant to regulations under Assembly Bill 52, Native American tribes that had requested to be included in the planning process were contacted by the Town of Loomis to identify any tribal cultural resources that may be affected by the project. One response was received from the United Auburn Indian Community (UAIC). While this correspondence did not indicate any specific concerns for the project, UAIC indicated that they would like to receive a copy of this technical report and the EIR and requested tribal representatives be present during cultural resources surveys.

A pedestrian cultural resources survey of the project area was conducted on August 28, 2017. One historic cultural resource site, consisting of house foundations, a historic road, and a trash scatter, and two isolated ground stone fragments were observed. These resources are not considered significant under National Register of Historic Places or California Register of Historical Resources criteria. Therefore, it is recommended that the proposed project will have a finding of no historic properties affected.

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ACRONYMS

AB	Assembly Bill
APE	Area of Potential Effect
BP	Before Present
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CRHP	California Register of Historic Places
CRHR	California Register of Historical Resources
DPR	California Department of Parks and Recreation
EAs	Environmental Assessments
EIR	Environmental Impact Report
EISs	Environmental Impact Statements
FR	Federal Register
ft2	square-foot
GLO	General Land Office
GPS	global positioning system
IS	Initial Study
m	meters
MLD	Most Likely Descendant
MND	Mitigated Negative Declaration
NAHC	Native American Heritage Commission
NCIC	North Central Information Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
UAIC	United Auburn Indian Community
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

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1 INTRODUCTION

Under contract to the Town of Loomis, AECOM conducted a cultural resource investigation for the proposed Loomis Costco Warehouse. This document was prepared in compliance with the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA). The purpose of this study was to assess the potential for the Project to affect cultural resources potentially eligible for listing in the National Register of Historic Places (NRHP) or California Register of Historic Places (CRHP). Cultural resources are defined as buildings, sites, districts, structures, geographic areas, or objects having historical, architectural, archaeological, or cultural importance. Site research was conducted according to current professional and legal standards. The study team consisted of professionally trained archaeologists meeting the federal Secretary of the Interior's Standards and technical support staff.

1.1 PROJECT LOCATION

The proposed project is located in the Town of Loomis, Placer County, California, immediately southeast of the Brace Road and Sierra College Boulevard intersection (Figure 1). The project is located on the Rocklin, California U.S. Geological Survey (USGS) 7.5-minute quadrangle in Section 16 of Township 11 North, Range 7 East (Figure 2). The project area consists of assessor parcel numbers 045-042-034, 045-042-035, 045-042-036, 045-042-037, 045-042-011, and 045-042-012.

1.2 PROJECT DESCRIPTION

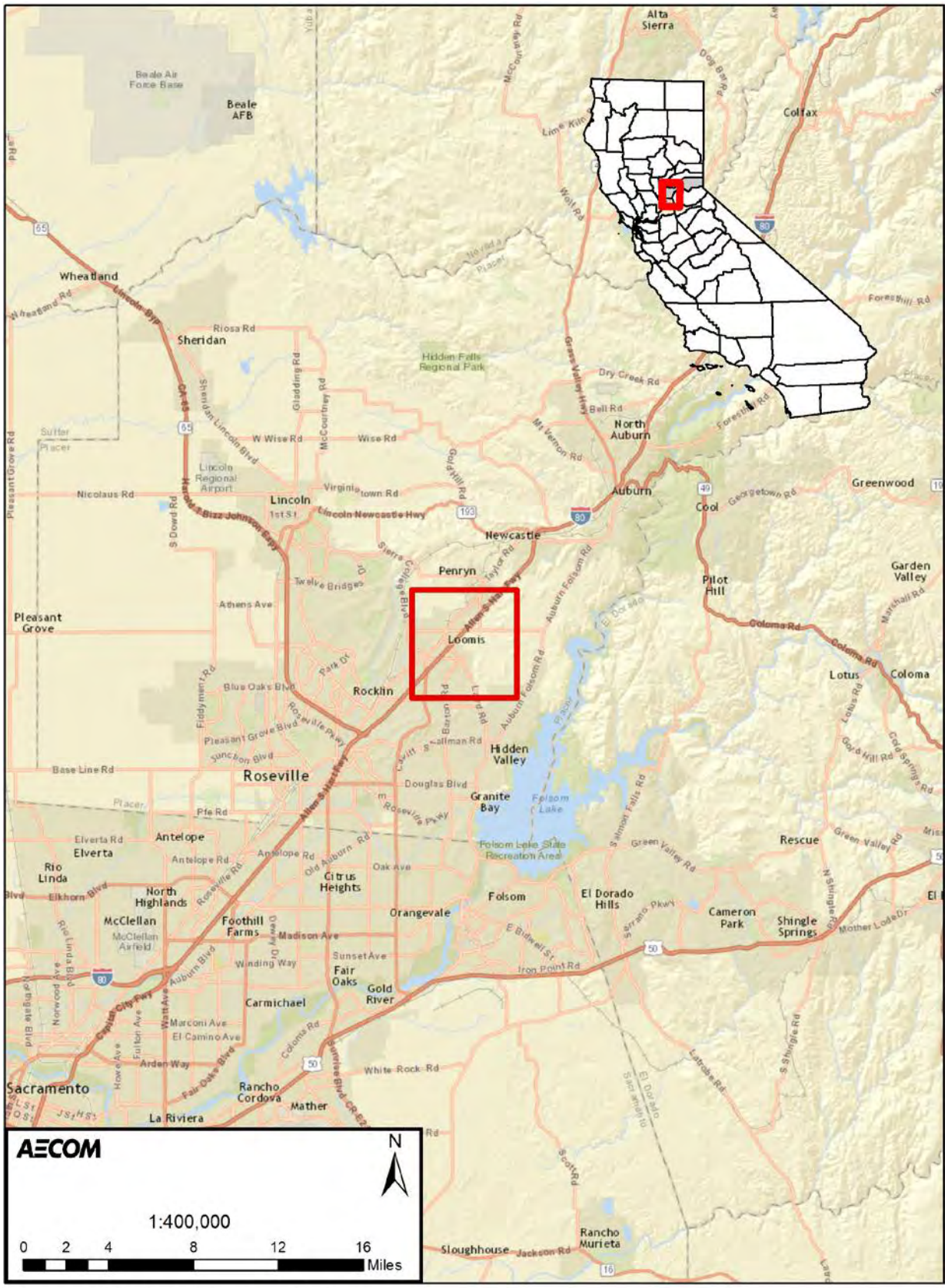
The Town of Loomis is preparing an Environmental Impact Report (EIR) for the proposed construction of a 152,101-square-foot (ft^2) Costco Wholesale warehouse building with approximately 777 parking stalls, a 24–30 dispenser fuel facility, and associated landscaping on an approximately17.38-acre parcel.

1.3 DEFINITION OF UNDERTAKING

The project requires authorization from the U.S. Army Corps of Engineers (USACE) for water quality permits under the Clean Water Act, including a Section 401 water quality certification and Section 404 permits for discharge of fill into waters of the United States associated with impacts on 0.15 acre of vegetated palustrine emergent wetlands. These actions constitute undertakings requiring compliance with Section 106 of the National Historic Preservation Act (NHPA) (16 USC Section 470f). USACE is the lead federal agency for Section 106 compliance.

1.4 DEFINITION OF AREA OF POTENTIAL EFFECT

The Area of Potential Effect (APE) is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking" (Title 36, Section 800.16[d] of the Code of Federal Regulations [36 CFR 800.16(d)]). For this project, the APE is considered to be the limits of construction and construction-related activities where ground disturbance would occur. The APE for this project is the footprint of the proposed Costco Warehouse, parking lot, dispenser fuel facility and associated landscaping (Figure 2).



Source: ESRI World Street Map, 2013

Figure 1. Project Location

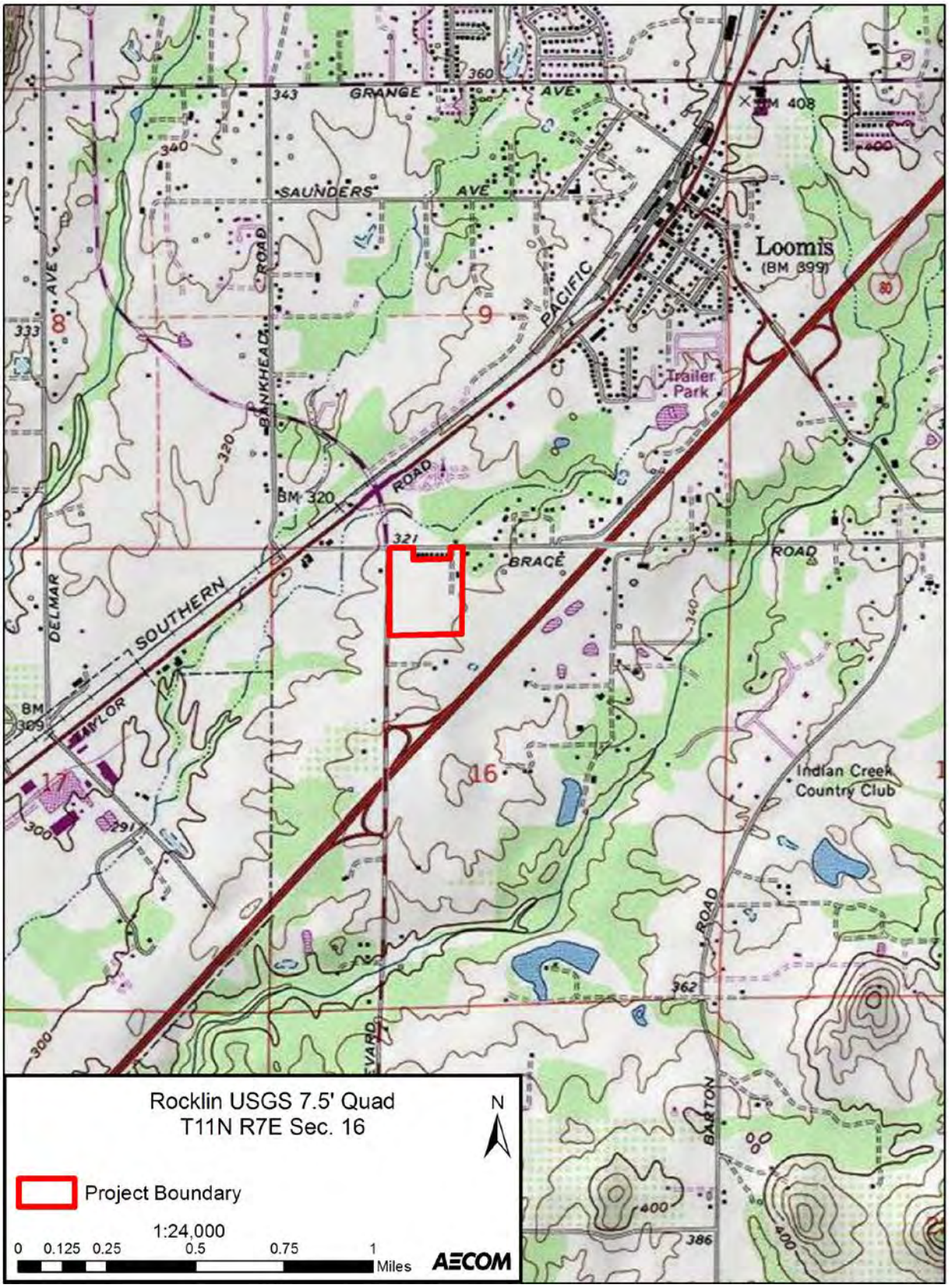


Figure 2. Area of Potential Effects.

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2 REGULATORY CONTEXT

Cultural resources in California are protected by a number of federal, state, and local regulations and ordinances. The most frequently applied legislation consists of the provisions of Section 106 and CEQA that provide for the documentation and protection of significant prehistoric and historic period resources.

2.1 FEDERAL

Section 106 of the National Historic Preservation Act of 1966, as amended, requires that federal agencies, or those that they fund or permit, to take into account the effects of the undertaking on any historic properties listed on or eligible for listing on the NRHP and offer the Advisory Council on Historic Preservation and other interested parties an opportunity to comment on the actions. To determine whether an undertaking could affect historic properties, cultural resources (including archaeological, historical, architectural, and traditional cultural properties) must be inventoried and evaluated for inclusion on the NRHP. Cultural resources can be significant on the federal, state, or local level. The 36 CFR § 60.4 regulations describe the criteria to evaluate cultural resources for inclusion in the NRHP:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

a) That are associated with events that have made a significant contribution to the broad patterns of our history; or

b) That are associated with the lives of persons significant in our past; or

c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d) That have yielded, or may be likely to yield, information important in prehistory or history

2.2 STATE REGULATIONS

2.2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA offers directives regarding impacts on historical resources and unique archaeological resources. CEQA states generally that if implementation of a project would result in significant environmental impacts, then public agencies should determine whether such impacts can be substantially lessened or avoided through feasible mitigation measures or feasible alternatives. This general mandate applies equally to significant environmental effects related to certain cultural resources.

Only significant cultural resources (e.g., “historical resources” and “unique archaeological resources”) need to be addressed. State CEQA Guidelines define a “historical resource” as, among other things, “a resource listed or eligible for listing in the California Register of Historical Resources” (CRHR) (CEQA Guidelines, Section 15064.5, subdivision (a)(1); see also Public Resources Code Sections 5024.1, 21084.1.) A historical resource may be eligible for inclusion in the CRHR, as determined by the State Historical Resources Commission or the lead agency, if the resource:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; or

2. Is associated with the lives of persons important in our past; or

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, a resource is presumed to constitute a "historical resource" if it is included in a "local register of historical resources" unless "the preponderance of evidence demonstrates that it is not historically or culturally significant" (CEQA Guidelines, Section 15064.5, subdivision (a)(2)). The State CEQA Guidelines require consideration of unique archaeological sites (Section 15064.5). (See also Public Resources Code Section 21083.2.) A "unique archaeological resource" is defined as "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person (Section 21083.2).

If a cultural resource does not meet the criteria for inclusion in the CRHR but does meet the definition of a unique archaeological resource as outlined in the Public Resources Code (Section 21083.2), it is entitled to special protection or attention under CEQA. Treatment options under Section 21083.2 of CEQA include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a "unique archaeological resource").

Public Resources Code Section 15064.5(e) of the State CEQA Guidelines requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. At that time, Section 15064.5(d) of the State CEQA Guidelines directs the lead agency to consult with the appropriate Native Americans as identified by the NAHC and directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

3 BACKGROUND

3.1 ENVIRONMENTAL SETTING

The proposed project is located in the foothill region of the Sierra Nevada. Elevations within the project area range from 97 meters (m) (320 feet) to 103 m (340 feet) above mean sea level. Geologically, the area is characterized by Andregg coarse sandy loam soils (Wagner et al. 1987). The climate of the region is classified as Mediterranean with cool, wet winters and dry, hot summers. Oak woodland mixed with disturbance-loving plant species such as star thistle (*Centaurea solstitaialis*) and cheat grass (*Bromus tectorum*) dominates the project area. Amphibians and reptiles found in oak woodlands include Pacific tree frog (*Hyla regilla*), western fence lizard (*Sceloporus occidentalis*), and California kingsnake (*Lampropeltis getulus*). Common resident birds in these forests include acorn woodpecker (*Melanerpes formicivorus*), western scrub-jay (*Aphelocoma californica*), oak titmouse (*Baeolophus inornatus*), and wrentit (*Chaemaea fasciata*). Common mammals in these mixed woodlands include gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), and Douglas' squirrel (*Tamiasciurus douglasi*) (Deis 2007). During survey, wild turkeys (*Meleagris gallopavo*) and feral cats (*Felis catus*) were also noted in the project area.

3.2 PREHISTORIC CONTEXT

The archaeology of the project area is included within the broad framework established by archaeologists for the Sacramento Valley. Although human occupation of the northern Sacramento Valley may extend back 10,000 years or more, reliable evidence of the presence of such an early human presence is lacking. Early archaeological sites bearing evidence of these Paleo-Indian populations may be present in the valley but deeply buried under alluvium (Moratto 1984).

For the Sacramento Valley and foothill regions, Lillard and Purves (1936) recognized a three-part cultural sequence (Early, Middle, and Late horizons) that was derived from the archaeological analysis of midden and cemetery sites in Central California. This scheme was later described in more detail by Lillard et al. (1939) and was refined by Beardsley (1948 and 1954). In an attempt to unify the various hypothesized cultural periods in California, Fredrickson (1973, 1974, and 1993) proposed an all-encompassing scheme for cultural development, while acknowledging that these general trends may manifest themselves differently and some variation between subregions may exist. These general cultural periods (Paleo-Indian, Early, Middle and Late Archaic, and Emergent periods) are used here in connection with the North-Central Sierra Nevada chronology.

This horizon scheme, referred to as the Central California Taxonomic System, does not account well for cultural variation between subregions, or for gradual changes through time. It deals primarily with material culture and pays little attention to subsistence and settlement, social organization, or other patterns of behavior. As Moratto (1984:201) has observed, "central California prehistory was far too complex and dynamic to have been represented by [such] a monolithic scheme." Consequently, later researchers have broken the region and its prehistory into local districts and phases (Elsasser 1978). New radiocarbon determinations adjusted with modern calibration curves are now used for a more precise time frame (Rosenthal et al. 2007:147–153). These different cultural patterns are characterized as:

- **The Paleo-Indian Period:** The Paleo-Indian Period (12,000 to 10,500 Before Present [BP]) saw the first demonstrated entry and spread of humans into California. Characteristic artifacts recovered from archaeological sites of this time period include fluted projectile points (constructed from chipped stones that have a long groove down the center called a "flute") and large, roughly fashioned cobble and bifacially-flaked stone tools that were used in hunting "big game" such as mastodon, bison, and mammoth that roamed the land during this time.

- **The Lower Archaic Period:** The beginning of the Lower Archaic Period (10,500 to 7500 BP) coincides with that of the Middle Holocene climatic change that resulted in widespread floodplain deposition. This episode resulted in most of the early archaeological deposits being buried. Most tools were manufactured of local materials, and distinctive artifact types include large dart points and the milling slab and handstone.

- **The Middle Archaic Period:** The Middle Archaic Period (7500 to 2500 BP) is characterized by warm, dry conditions that brought about the drying up of pluvial lakes. Economies were more diversified and may have included the introduction of acorn processing technology, although hunting remained an important source of food. Artifacts characteristic of this period include milling stones and pestles and a continued use of a variety of implements interpreted as large dart points.

- **The Upper Archaic Period:** The Upper Archaic Period (2500 to 850 BP) corresponds with a sudden turn to a cooler, wetter and more stable climate. The development of status distinctions based upon wealth is well documented in the archaeological record. The development of specialized tools, such as bone implements and stone plummets, and manufactured shell goods were prolific during this time. The regional variance of economies was largely due to the seasonality of resources, which were harvested and processed in large quantities.

- **The Emergent Period:** Several technological and social changes distinguish the Emergent Period (850 BP to Historic) from earlier cultural manifestations. The bow and arrow were introduced, ultimately replacing the dart and throwing spear, and territorial boundaries between groups became well established. In the latter portion of this period (450 to 1800 BP), exchange relations became highly regularized and sophisticated. The clam disk bead developed as a monetary unit of exchange, and increasing quantities of goods moved greater distances. It was at the end of this time period that contact with Euroamericans became commonplace, eventually leading to intense pressures on Native American populations.

3.2.1 ETHNOGRAPHIC CONTEXT

The project site is situated within the traditional territory of the Nisenan. The western boundary of Nisenan territory was the western bank of the Sacramento River; the eastern boundary was the crest of the Sierra Nevada; and the southern boundary was likely a few miles south of the American River. The northern boundary has not been clearly established due to similarities in language with neighboring tribes (Wilson and Towne 1978:387–389).

Nisenan settlement locations depended primarily on elevation, exposure, and proximity to water and other resources. Permanent villages were usually located on low rises along major watercourses. Houses were domed structures measuring 10 to 15 feet in diameter and covered with earth and grass. Brush shelters were used in the summer and at temporary camps during food-gathering rounds. Larger villages often had semi-subterranean dance houses that were covered in earth, grass, or brush; a central hole at the top to allow the escape of smoke, and an east-facing entrance. Another common village structure was the granary, which was used for storing acorns.

The rich valley environment the Nisenan occupied provided abundant year-round food resources. Hunting, gathering, and fishing went on throughout the year though what was procured depended on seasonal availability. Due to this seasonal variability, the Nisenan did not rely on a single crop, but on many different staples such as acorns, seeds, nuts, grasses, herbs, roots, tubers, berries, and wild fruits. Deer, rabbit, and salmon were the chief sources of animal protein in the aboriginal diet, but many insect and other animal species were taken when available (Wilson and Towne 1978:389). Today, Nisenan descendants are reinvesting in their traditions and represent a growing and thriving community.

3.3 HISTORIC CONTEXT

Aside from early Spanish explorers, the Sierra Nevada foothill region and Sacramento Valley were virtually unknown by Europeans before the Gold Rush. A wave of gold seekers descended on California and the foothill and mountain regions of the Sierra Nevada following the discovery of gold at Coloma on the South Fork American River in January 1848. The 1850 U.S. Census put the population of Placer County at 11,417, consisting of 6,945 whites, 3,019 Chinese, 89 blacks, 634 other foreign races, and 730 Native Americans (U.S. Census 1850). However, the population was likely larger as the Census was biased against minority groups, which were underrepresented.

Mining sites consist of artifact concentrations and feature systems that reflect the myriad of operations and technologies that have been used in the area. These cycles of occupation and abandonment create layers or components of mining technology and systems that are horizontally stratified, often altering or obliterating previous operations, and can often be viewed as discontinuous with underground structure (Hardesty 1988:11–12). Many times, only fragments of technologies and operations are visible. For example, Lindstrom (1989:38) found that placer mining operations resulted in finer sediments being carried away during the washing process, with only larger cobbles or boulders remaining at the processing site.

Mining camps were ubiquitous in mid-19th century Placer County. Secret Ravine, a perennial tributary of Dry Creek that feeds into the Sacrament River, runs southwest from Auburn to Roseville and was the site of extensive placer mine workings during the Gold Rush and granite mining after the Gold Rush. Mining camps along Secret Ravine include Newcastle, Stewart's Flat, Penryn, and the Town of Loomis.

The Town of Loomis was originally known as the Pine Grove mining camp, which was established in 1850 (Hoover et al. 1966:272). The Pine Grove mining camp was associated with the Placer Post Office, which changed its name to Smithville in 1862, then to Pino in 1869 after the mining camp, and finally to Loomis in 1890 with the arrival of the Southern Pacific Railroad (Durham 1998:516). Loomis incorporated in 1984 as a way to avoid being annexed by Rocklin.

The Central Pacific Railroad, which was the western portion of the first transcontinental railroad in the United States, started construction in Sacramento in 1863. In 1885, the Central Pacific Railroad was leased to Southern Pacific Railroad. The Town of Loomis moved about a mile northwest of its original mining camp location to better access the railroad in 1864 (Windmiller 2006). While the transcontinental railroad was important nationally as it linked the east and west coasts of the United States, locally the existence of the railroad made it easier to transport the foothills products such as agriculture, timber, and granite to the markets in Sacramento and San Francisco, allowing for continual economic development after the Gold Rush.

After the Gold Rush panned out, granite mining continued in Placer County around the Rocklin area, including the Loomis area. Granite occurs as residual surface boulders and batholith from Folsom to Lincoln (Davis 1990:13). Folsom Granite Company was the largest company, but over 60 independent operations existed in the Rocklin area (Derr and Rondeau 1979). The local granite was used as a building material in Sacramento, San Francisco and the Bay Area, and even as far away as Hawaii (Davis 1990:129). The waste material from granite mining was also used in railroad and levee construction.

By the late 19th century, the increase of new mining camps appearing in Placer County slowed considerably, and other economic pursuits, such as ranching and agriculture, became the backbone of Placer County's economy. Ranching and agriculture, which had once been support systems that provided food to the miners, grew to become dominant industries. As thousands of miners poured into the area during the early 1850s, farmers and ranchers put additional acreage into production to meet the demand for potatoes, flour, and various dairy products.

The first of such settlements in Placer County was Sicard's Ranch, a Mexican grant on the south bank of the Bear River, west of the project area. The grant was given to Theodore Sicard in 1844. Sicard, a French sailor, built an adobe house on the land in 1846, which later became a prominent stopping place for travelers on the way to Sutter's Fort in Sacramento. Sicard and fellow countryman Claude Chana, who had arrived at the ranch in late 1846, planted peach and almond trees, which became the start of the commercial orchard business in the Sacramento Valley. Chana later bought the Sicard grant, and sold the products of his orchard, vineyard, and vegetable garden to area miners (Hoover et al. 1966).

Closer to the project area, the Takahashi farm (CA-PLA-1078H) was located approximately 250 m to the south of the project area, at the current location of the Rocklin Commons mall, between Sierra College Boulevard and Granite Drive. The Takahasi farm had originally been part of the Himes Tract, which was subdivided into 10-acre lots during the 1890s (ECORP 2006). In the early 20th century, Japanese families, including the Takahashi family, were buying lots in the Himes Tract. The Takahashi farm was occupied by three generations of the family from 1924 to 1990 (ECORP 2006:11).

3.4 SIGNIFICANCE REQUIREMENTS

This inventory report is intended to identify the presence of cultural resources in the APE that are considered significant under NRHP or CRHR criteria, and are therefore determined to be historic properties; determine whether the project would adversely affect any historic properties; and provide mitigation measures to limit potential impacts on historic properties.

Given the region's prehistoric, ethnographic, and historic contexts as described above, cultural resources in the project area are expected to reflect the mining, ranching, and agricultural activities that occurred in the general project vicinity. However, prehistoric cultural resources may also be present, in the form of bedrock milling features or small campsites.

3.4.1 ELIGIBILITY CONSIDERATIONS

3.4.2 PREHISTORIC RESOURCES

Based on documentary investigations, Native American consultation, and fieldwork, prehistoric resources that may be uncovered include local manifestations of regional subsistence, settlement, and exchange. Typically, prehistoric resources are bedrock milling features; the remains of human habitation including midden soils, lithic, and faunal remains; and lithic scatters.

To be recommended as significant under NHPA Section 106 or the State CEQA Guidelines, prehistoric sites must possess integrity, and must qualify under one or more of the four NRHP/CRHR significance criteria described in Chapter 2, as explained further below.

- **NRHP Criterion A or CRHR Criterion 1:** The resource must be associated with events significant to the broad patterns of history. Resources must contain some evidence of such an association. For prehistoric sites, there should be evidence that the site was especially important to the Native American residents of the area as a village, meeting place, or ceremonial site, or in some other capacity. Examples of such evidence include large numbers of residential features and ceremonial objects.

- **NRHP Criterion B or CRHR Criterion 2:** The resource must be associated with the lives of persons significant in the past. Documentary or artifactual evidence could demonstrate, or oral tradition could attest to, such an association. If the evidence were not artifactual, it would have to specify the site's location with

sufficient accuracy to allow unequivocal identification of the location. Artifactual evidence would have to support the claim of association, or to reasonably corroborate documentary or testamentary claims.

- **NRHP Criterion C or CRHR Criterion 3:** The resource must embody the distinctive characteristics of a type, period, or building method; represent the work of a master; possess high artistic value; or represent a distinguishable entity whose components lack individual distinction. The presence of prehistoric architecture or rock art would most likely qualify a site under NRHP Criterion C or CRHR Criterion 3.

- **NRHP Criterion D or CRHR Criterion 4:** The resource must contain, or must be likely to contain data, that can further our understanding of prehistory. These data must also be in a context that has not been significantly affected by natural processes or subsequent cultural activities.

3.4.3 HISTORIC RESOURCES

A review of historic documents indicates that historic mining and ranching/ agriculture constitute the primary historic themes that may be present in the project area. The discussions below address NRHP/CRHR eligibility considerations and integrity considerations for these themes, along with the theme of irrigation and water conveyance systems.

MINING-RELATED FEATURES

The remains of small-scale operations, consisting of prospects, placer mining, and associated refuse, are the types of mining-related sites most likely to be encountered in the project area. These features are limited in duration of use and scale, but they have the potential to provide data not often described in the historic literature.

NRHP/CRHR Eligibility Considerations

To be considered eligible under NRHP and/or CRHR criteria, mining-related properties must:

- display evidence of a permanent operation that contributed to the development of mining or mining technology in the region;

- exhibit evidence of new approaches or represent innovative approaches to mining; or

- be the first or last of an era.

The presence of archaeological deposits may qualify the site as eligible under NRHP Criterion D and/or CRHR Criterion 4 if the data have the potential to address one or more of the research issues mentioned above. Refuse deposits may provide information about the success of the mining operation, the ability of the operators to adjust to changing technology, operations during a particular period of history, or the lifeways and/or composition of work groups.

Integrity Considerations

Mining features must retain the character and feeling of the original resource, with limited impacts from natural processes or subsequent historic modifications or impacts. Associated archaeological deposits must be in the original matrix and not mixed with subsequent operations or other historic events.

RANCHING AND AGRICULTURE

Since the Gold Rush, the project area has been dominated by ranching and farming. The heritage of farming and ranching in the project vicinity dates to the 1850s, when settlers established ranches to meet the food demands of mining operations. Local ranchers and farmers have experienced many economic fluctuations since those early years, and rural development has replaced many farms and ranches recently.

Permanent ranch or farming operations with complexes of buildings have been documented in the cultural resources inventory for HFRP. The following types of facilities and remains are likely to be encountered:

- Water conveyance systems, including dams and catchment basins
- Corrals
- Barns and sheds
- Structural remains
- Refuse dumps and scatters

NRHP/CRHR Eligibility Considerations

To be eligible for the NRHP or CRHR, ranching and agriculture–related resources must display the characteristics summarized below.

- **NRHP Criterion A or B or CRHR Criterion 1 or 2:** The resource must have been permanent and used for a number of sequential years, and thus must be capable of interpretation for its role in the development of the local livestock and farming industry. Alternatively, the site could be associated with the career of a person important in the local evolution of the livestock or farming industry. In this case, to be considered eligible under NRHP Criterion B or CRHR Criterion 2, the locale must have been used and occupied by an important personage, not simply owned or remotely operated by the person.

  The resource also must maintain enough of its historic fabric to make its function readily apparent. The properties may be found either singularly or as part of a complex or system. In a complex or system, the contributing resource must be at least 50 years old. The features or objects must be in their original location or their location during the period of significance, and the setting must convey their historic feeling or function. For architectural resources, additions or modification must not impair the quality of the historic fabric (design, materials, and workmanship) of the individual resource.

- **NRHP Criterion D or CRHR Criterion 4:** The resource must be able to offer significant quantities of information to address research questions and retain a sufficient degree of integrity (as summarized below).

Sites and features in the project area tend to have minimal built or constructed features and generally are considered more important for the information they may contain than for their architectural presence. Thus, these resources generally will not be considered eligible under NRHP Criterion C or CRHR Criterion 3.

Integrity Considerations

For archaeological expressions to be considered to possess integrity, all of the aforementioned properties, features, and site types must not exhibit evidence of extensive post-depositional disturbance.

For farms and ranches, the resource must convey its historic function and modern repairs. Additions and maintenance activities must not have significantly impaired the resource's historic fabric and character and its relationship to ranching operations. Those same activities are also considered when determining the site's integrity as an archaeological resource, because they would disturb the archaeological matrix.

IRRIGATION AND WATER CONVEYANCE SYSTEMS

Historically, adequate water has been available for use in Placer County; however, the water was not always conveniently located to meet the irrigation needs of farming, ranching, and mining. Securing water supplies has been a key element of successful Euro-American use of Placer County and California as a whole. During the past 150 years, growing numbers of people in California have recognized the need for adequate and reliable water supplies, at first to supply the needs of miners and later to supply electrical generation facilities and enable irrigation. This recognition led to the development of water storage and distribution systems, which can be categorized by their funding type (private or public), size and scale (small to very large), number of users served, and type of water usage.

The property types pertinent to the study area and the theme of water resource development are irrigation and their component elements, consisting of dams, canals, ditches, laterals or spreaders, diversion dams, head gates, pipes, siphons, drop boxes, flumes, and silt boxes. In the project area, the purpose is to provide irrigation water for agricultural expansion on arid lands. These resources may be eligible under NRHP Criteria A–C or CRHR Criteria 1–3. These resources may also be eligible under NRHP Criterion D or CRHR Criterion 4 if associated archaeological deposits are present. Beyond that, any features must be among the earliest in a given drainage or watershed. For this region of California, any ditches and their water rights must be dateable to the mid-19th or early 20th century (1850–1910). The property types and registration requirements outlined below were determined based on archival research and a review of published sources that show the types of ditches recorded and expected to be found in the study area.

NRHP/CRHR Eligibility Considerations

To be eligible for the NRHP or CRHR, resources related to irrigation and water conveyance systems must meet the requirements summarized below.

- **NRHP Criterion A or CRHR Criterion 1:** Irrigation and water conveyance systems (e.g., diversion dams, head gates, pipes, canals, siphons, drop boxes, flumes, silt boxes) must be associated with one or more historic themes important to the development of the region, and must clearly portray that theme. In addition, the features must be good examples of those systems.

- **NRHP Criterion B or CRHR Criterion 2:** The components or system must be associated with an individual or group of individuals who were important in the development of water conveyance systems, ranching, or farming. Furthermore, the associated individuals must have been actively engaged in the operations, and not merely investors or owners.

- **NRHP Criterion C or CRHR Criterion 3:** Construction materials, features, or methods of construction must be representative of irrigation systems, with engineered elements that are significant or that demonstrate an evolution in the construction of irrigation systems.

- **NRHP Criterion D or CRHR Criterion 4:** Archaeological deposits associated with the resources must be capable of use to further define methods of construction, time periods, cultural affinity, or uses of the system.

Integrity Considerations

Segments of irrigation and water conveyance systems may be found either singularly or as a system. A singular element's function, purpose, and role within the larger system should be capable of interpretation. The feature or object must be in its original location or the location during the period of significance, and the setting must be present to convey a historic feeling and function. Although additions or modifications must not impair the quality or the historic fabric (e.g., design, materials, and workmanship) of the individual element or system, ditches and their

associated delivery systems must be viewed as dynamic when assessing integrity. For example, ongoing maintenance activities must be conducted periodically, which will cause changes to any given ditch. However, substantial upgrades, such as adding concrete lining or converting a dirt ditch to pipe, will be considered to have compromised the historic fabric and feeling. Therefore, a substantially altered ditch, or the altered portions, will be considered ineligible.

In summary, features of irrigation and water conveyance systems should be clearly evident, not filled in or substantially modified, and accurately dated. The only exceptions applicable to these property types occur when the property is representative of a once-larger property category that has now become relatively scarce.

4 PREFIELD INVESTIGATIONS

Cultural resource investigations for the proposed project consisted of several elements: Native American consultation, pre-field research including previous investigations, and pedestrian survey of the project area. All aspects of the cultural resource study were conducted in accordance with guidelines outlined in the federal *Secretary of the Interior's Standards and Guidelines for the Identification of Cultural Resources* (48 Federal Register [FR] 44720–23) and the Office of Historic Preservation's (OHP's) *Instructions for Recording Historical Resources* (OHP 1995).

4.1 RECORDS SEARCH RESULTS

Pre-field research consisted of a records search at the North Central Information Center (NCIC) of the California Historical Resources Information System, conducted on August 2, 2017. Records maintained by the NCIC include California Department of Parks and Recreation (DPR) Series 523 archaeological site records, site location maps, maps of previous study coverage, National Register of Historic Places (NRHP) Nomination Forms, and relevant historical documentation and maps. The NCIC research also included a review of the following sources, all of which are on file at the information center:

- NRHP (National Park Service 1996, and computer updates 1966–present)
- CRHR (State of California, through present)
- California Points of Historical Interest (State of California 1992 and updates)
- Historic Spots in California (State of California 1966)
- Directory of Properties in the Historical Resources Inventory (State of California 1976 and updates)
- Historic Property Data File (OHP)
- California Historical Landmarks (OHP, DPR 1990)
- General Land Office (GLO) plat map (Bureau of Land Management)

This review indicated that no cultural resources investigations have occurred within the project area and 17 have been conducted within 0.25 mile (Table 1).

No cultural resources have been recorded within the project area. A total of nine prehistoric and historic archaeological sites have been recorded within 0.25 mile of the project area (Table 2). Resources generally consist of prehistoric bedrock milling features and historic habitation, mining, or ranching sites.

Table 1. Previously Conducted Cultural Resources Inventories within 0.25 Mile of APE.

Report #	Authors	Title	Date
278	Peck, B. J.	An Archaeological Survey of the Proposed Sierra College Boulevard/ Brace Road Shopping Center, Placer County, California	1979
401	Derr, E. H. and M. F. Rondeau	An Intensive Archaeological Survey of the Proposed Stonegate Development Project, Placer County, California	1979
2935	Jones and Stokes, Inc.	Heritage Resources Report for the Pacific Fiber Link/ Williams Fiber Optic Cable System Installation Project: Tahoe National Forest	1999
3945	Peak and Associates	Cultural Resources Assessment of the Rocklin Regional Mall Project, Placer County, California	1988
5999	Kelley, J., J. Marvin, C. Gerike, and N. Kaptain	Historic Property Survey Report (Positive) for the Sierra College Boulevard/ Interstate 80 Interchange Improvements	2002
6006	Windmiller, R.	Himes Tract Cultural Resources Inventory Rocklin, Placer County, California	2004
6414	ECORP Consulting	Cultural Resources Inventory Pedestrian Landscape, Placer County, California	2005
7023	Windmiller, R.	Archaeological Resources Inventory Homewood Lumber Relocation and Bob Cook Property Loomis Vicinity, Placer County, California	2006
8285	ECORP Consulting	Test Program Results and Evaluation for Archaeological Site CA-PLA-1901-H in the Rocklin Pavilions Project APE Rocklin, Placer County, California	2006
8286	ECORP Consulting	Cultural Resources Inventory Rocklin Commons (AKA Rocklin Pavilions)	2007
8619	SWCA	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project, State of California	2006
8660	Windmiller, R.	Granite Creek Plaza Cultural Resources Inventory and Evaluation Rocklin, Placer County, California	2007
8767	ECORP Consulting	Cultural Resources Assessment Rocklin 60 Placer County, California	2006
8874	ECORP Consulting	Cultural Resources Survey Report Jack in the Box- Granite Drive Placer County, California	2007
10434	Snyder, J. W.	Historic American Engineering Record 34-SAC-63 Central Pacific Transcontinental Railroad, Sacramento to Nevada state line, Sacramento, Sacramento County, California	n.d.
11468	Knapp, K., S. Pappas, and J. Adams	Cultural Resources Survey Report Sierra College at Granite Project, Placer County, California	2013
11482	Windmiller, R. and K. Vallaire	Sucker Ravine-Loomis Tributary “CLOMR” Cultural Resources Inventory and Evaluation Rocklin, Placer County, California	2014

Table 2. Previously Recorded Cultural Resources within 0.25 Mile of APE.

Primary #/ Trinomial #	Description	Recorded	Report #	NRHP/ CRHP eligibility
P-31-0423/ CA-PLA-297/H	Three bedrock milling features w/ 22 mortars; historic quarry	1979	401	Not Evaluated
P-31-0964/ CA-PLA-841H	First Transcontinental Railroad	1998	7340, 8767, 9326	Listed California Historical Landmark
P-31-1295/ CA-PLA-1003H	Lincoln Highway/Victory Highway	1999	7928, 9572, 10101	Portions eligible for listing
P-31-1391/ CA-PLA-1078H	Takahashi Farm	2001	8285	Not Eligible
P-31-1520	Historic granite fence posts	1988	3945	Not Eligible
P-31-1554/ CA-PLA-1212	Bedrock mortar	1988	3941, 6640, 5999	Not Evaluated
P-31-2473/ CA-PLA-1768H	Water conveyance feature, mining tailings	2004	6006, 11482	Not Eligible
P-31-2704/ CA-PLA-1901	Bedrock mortars	2005	8285	Not Eligible
P-31-3154/ CA-PLA-2178H	Water reservoir, mining related	2007	8660, 11482	Not Eligible

4.2 HISTORIC MAPS

4.2.1 GENERAL LAND OFFICE (GLO)

A review of historic maps was conducted to define past landscape conditions and determine what buildings or structures may have existed within or near the project area. The 1856 GLO plat map of T11N R7E does not depict any structures or roads within the project area (see Figure 3Figure 3. T11N R7E 1856 GLO plat, APE outlined in red.). Few features are indicated in the surrounding area; but “Clover Valley” is named and multiple residences are noted, including Indian Valley Hotel (Section 1), unnamed farmhouse and house (Section 4), Gouldsby’s House (Section 5), Howe and Richardson’s (Section 18), Thompson’s House (Section 10), and Crow’s House (Section 11).

4.2.2 HISTORIC USGS TOPOGRAPHIC MAPS

The mid-20th century USGS 7.5-minute topographic maps show little development in the project area, beyond the building of the apartment block north of the project area (Figure 4 and Figure 5). However, the construction of the Rocklins Commons mall and the Walmart SuperCenter, south of the project area at the intersection of Sierra College Boulevard and Interstate 80, demonstrate a change from agricultural land use to commercial and industrial in the late 20th/early 21st century, as a result of the eastward expansion of Rocklin. The 1967 topographic map shows the construction of the 4105 Starlight Lane house and the presence of Starlight Lane. No other structures are shown on historic topographic maps within the project area.

4.3 NATIVE AMERICAN HERITAGE COMMISSION SACRED LANDS SEARCH

AECOM contacted the NAHC August 1, 2017, to request a search of the NAHC Sacred Lands Files. At the time of final report writing, no response had been received.

4.4 NATIVE AMERICAN CONSULTATION

The Town of Loomis sent letters announcing the Notice of Preparation to the tribal organizations who had requested to be informed of CEQA projects under Assembly Bill (AB) 52 on May 15, 2017. One response was received from the United Auburn Indian Community (UAIC) on June 19, 2017. While this correspondence did not indicate any specific concerns for the project, it did indicate that UAIC would like to receive a copy of this technical report and the EIR. In addition, UAIC requested that tribal representatives be present for any cultural resources surveys. UAIC was informed of the planned cultural resources survey date so representatives could attend. The Town of Loomis also sent formal letters requesting consultation with UAIC under AB 52 on August 1, 2017.

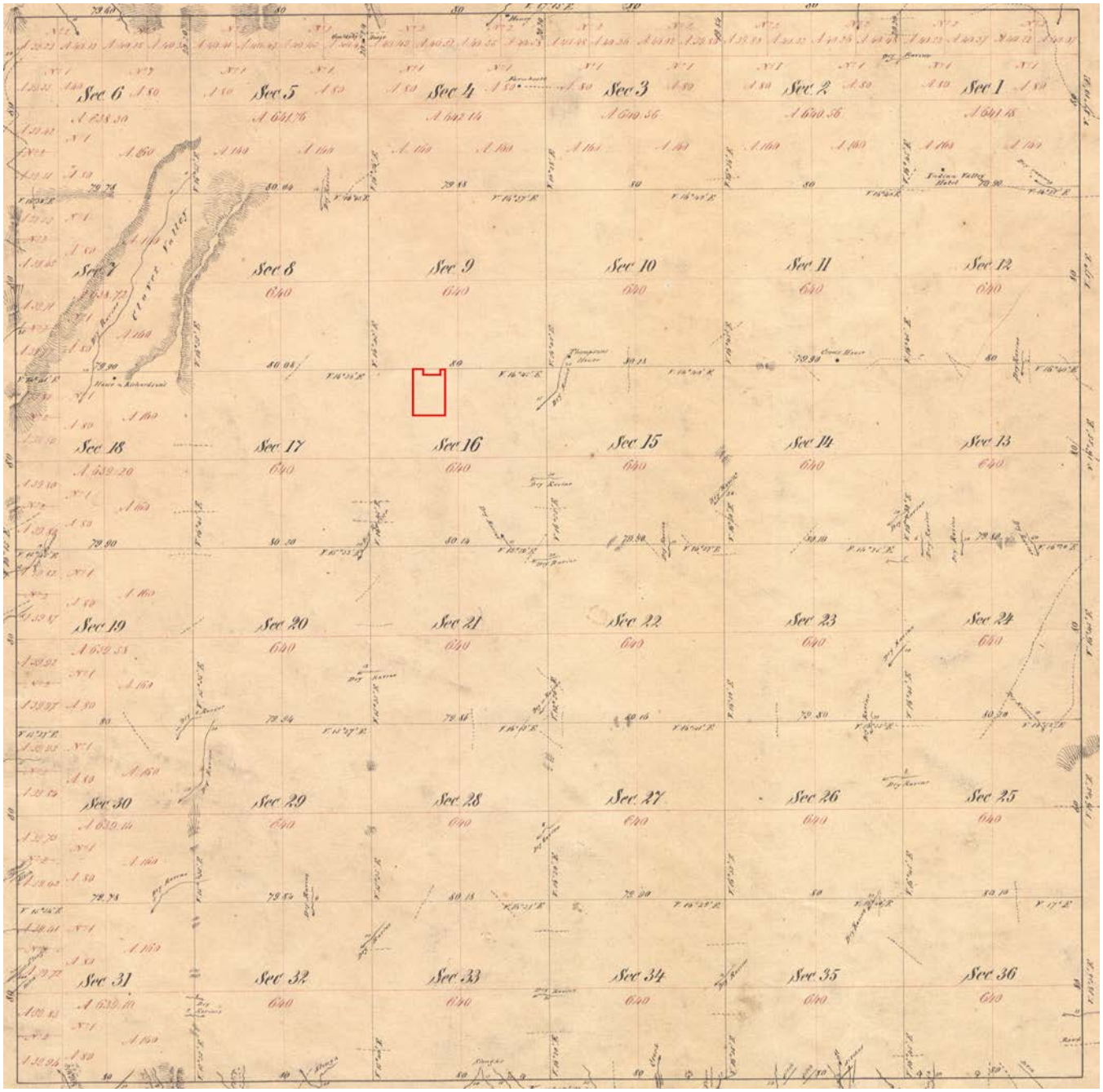

Figure 3. T11N R7E 1856 GLO plat, APE outlined in red.

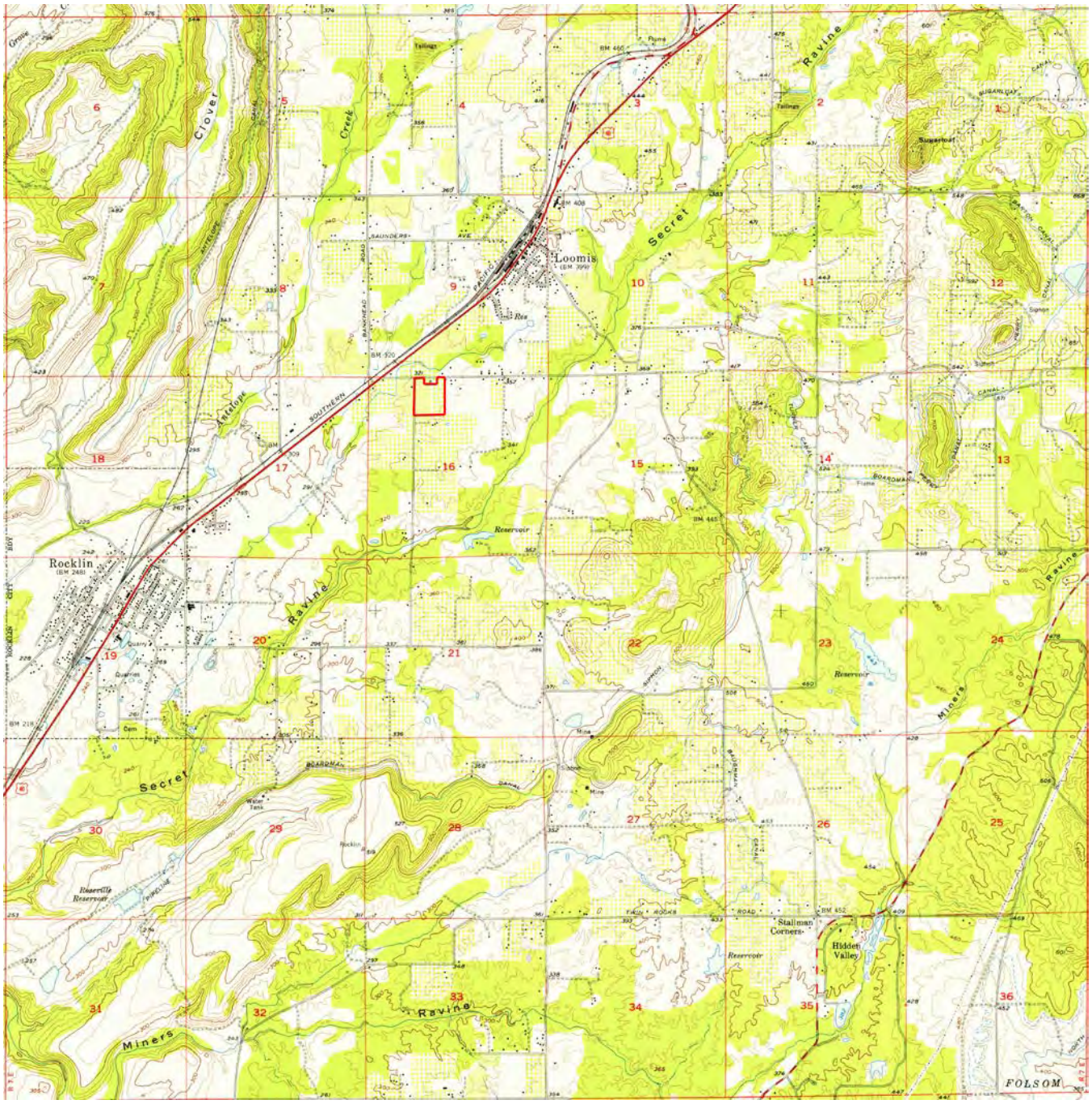

Figure 4. T11N R7E on USGS 7.5' Rocklin Quad, 1954. APE outlined in red.

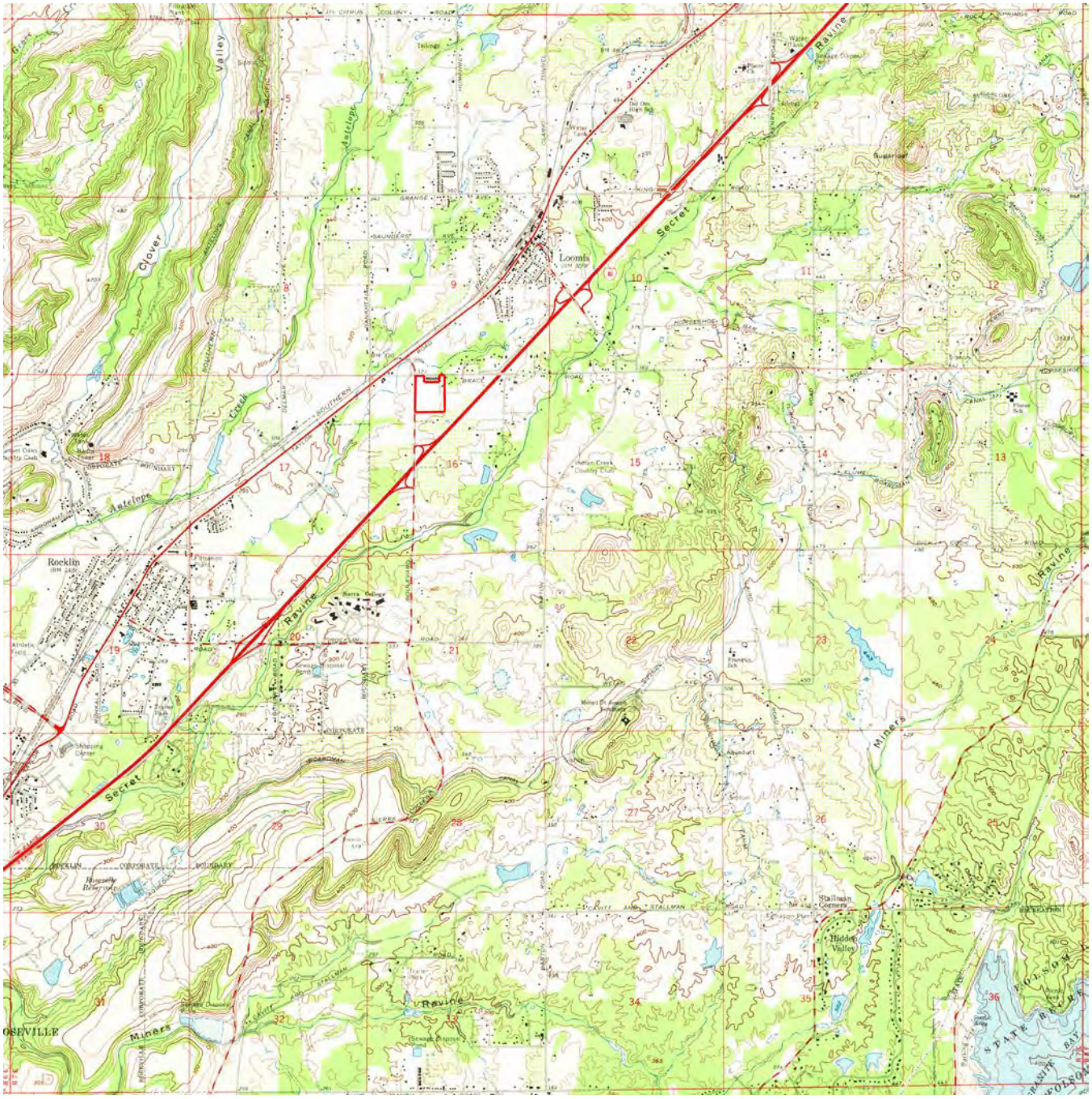

Figure 5. T11N R7E on USGS 7.5' Rocklin Quad, 1967. APE outlined in red.

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5 FIELD INVENTORY

Although no sites and no archaeological investigations have been documented within the area of potential effects (APE), previous studies and information provided by the NCIC indicate that the project area and the surrounding vicinity are sensitive for containing evidence of Native American occupation, early mining, and homesteads.

5.1 PEDESTRIAN SURVEY

AECOM cultural resources specialists Amy Jordan, PhD, and Laura Cook conducted the field surveys on August 28, 2017. Charles Hutcheson from UAIC accompanied AECOM archaeologists on the survey.

5.1.1 QUALIFICATIONS

Dr. Amy Jordan, received her PhD and MA degrees in Anthropology from the University of Washington, and received her undergraduate degree in archaeology from the University of Wisconsin. She meets the Secretary of the Interior's standards for work in archaeology. She has more than 10 years of experience in field and laboratory archaeology and archaeological collections management. She is familiar with California and Pacific Northwest Coast prehistory and history and has experience with preparing technical studies incompliance with CEQA, National Environmental Policy Act (NEPA), and NHPA Section 106. She has project management experience, including budget development and management and has extensive experience communicating to diverse audiences.

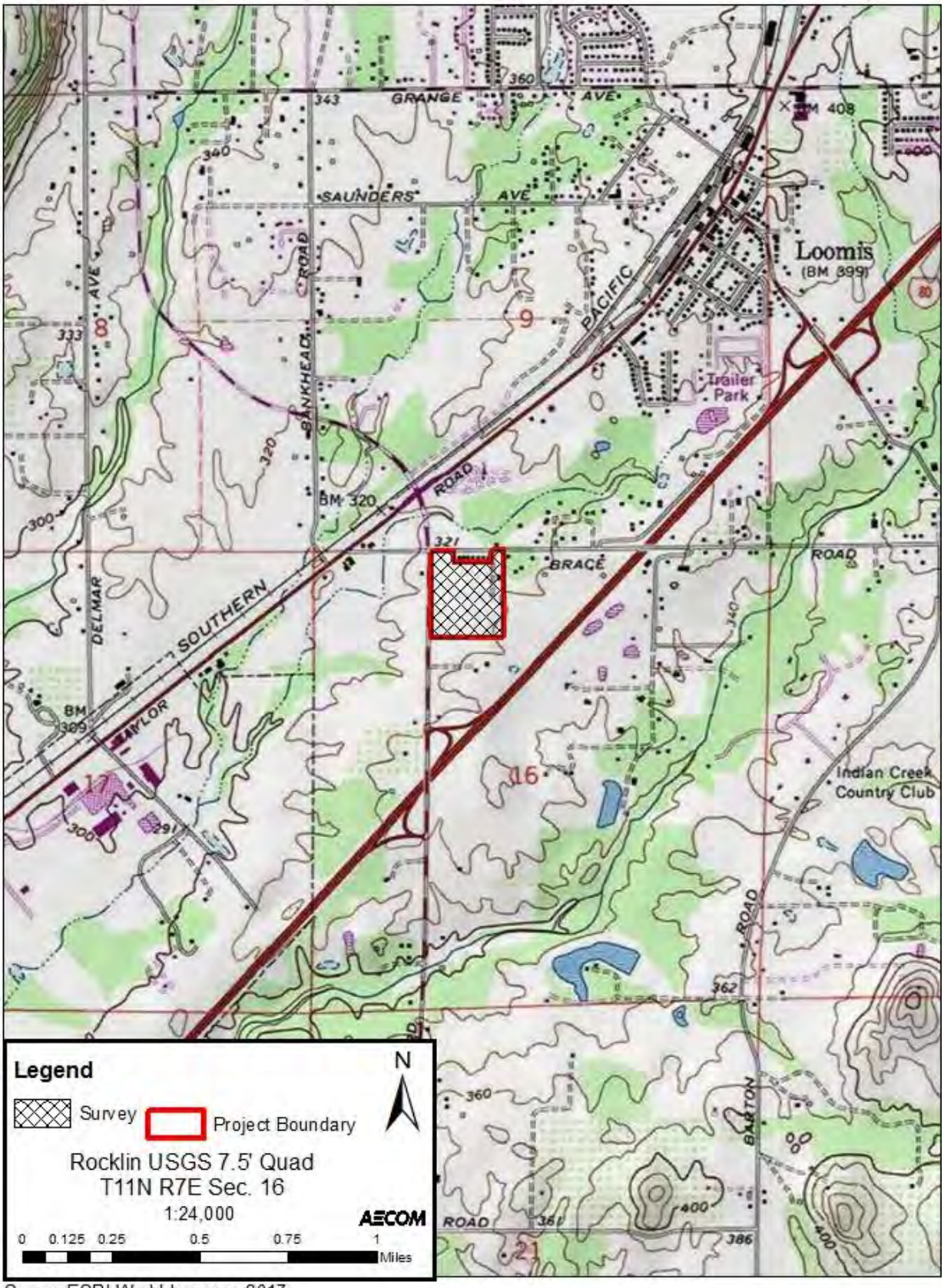
Laura Cook is an archaeologist with more than 9 years of experience in the western United States with an emphasis in California and Nevada. Mrs. Cook, received her BA in anthropology from U.C. Davis, and is an archaeological technician at AECOM where she is involved in all phases of archaeological documentation, including pedestrian survey, staged testing, excavation, construction monitoring, and technical report writing. Laura has worked extensively in the Sierra Nevada, including the Stanislaus National Forest where she was crew lead for 3 years, and the Eastern Sierra; throughout the Great Basin; and the Mojave Desert. While employed with the Forest Service, Laura completed rigorous fire trainings and functioned as a Burn Area Emergency Response team member on the 2013 Rim Fire and as a Resource Advisor on the 2014 El Portal Fire and 2015 South and Fork Complex Fires. Additionally, she has contributed significantly to numerous cultural resource reports for ISs, Environmental Assessments (EAs) EIRs, Initial Study/Mitigated Negative Declarations (IS/MNDs), and Environmental Impact Statements (EISs) and is knowledgeable with the implementation of CEQA, NEPA and Section 106.

5.1.2 METHODOLOGY

AECOM cultural resource specialists conducted an intensive field survey of the proposed project area on August 28, 2017 (Figure 6). Consistent with the Secretary of the Interior's standards and guidelines, the entire project area was surveyed using parallel 20- to 30 m transects. Disturbed areas with ground visibility were intensively examined for artifacts or other evidence of cultural activity.

Accurate and complete survey coverage of the project area was ensured through the use of a Trimble GeoXH 6000 series hand-held global positioning system (GPS) unit, which was cross-checked with topographic features represented on a USGS 7.5-minute quadrangle map with a projected NAD 83 UTM grid, and aerial photographic images. All sites and relevant features were mapped using the same GPS technology mentioned above.

Site information was recorded on appropriate DPR Series 523 forms. A Primary Record (DPR 523A) and an Archaeological Site Record (DPR 523C) was completed for documented resources, as appropriate.



Source:ESRI World Imagery, 2017

Figure 6. Surveyed Areas.

Ground surface visibility was relatively poor throughout the APE with 5% visibility due to non-native grasses, star thistle, and other pioneer species. Open areas under oak trees were examined for the presence of artifacts as were the freshly disturbed areas of heavy equipment tracks/ fire breaks.

5.1.3 FINDINGS

The inventory of the project area identified one historic cultural resource site, consisting of house foundations, a historic road, and a trash scatter, and two isolated ground stone fragments. Site documentation is presented in Appendix A.

5.1.3.1 4105 STARLIGHT LANE HOUSE FOUNDATIONS AND TRASH SCATTER

This site consists of three historic components: house foundation at 4105 Starlight Lane (Figure 7), the remnants of Starlight Lane, and a historic trash scatter located approximately 115 m southwest of the house foundations. The house was built in 1963, according to the Placer County tax assessor, and was demolished in early 2012. Starlight Lane continued to, and slightly past, the house, but the road is no longer in use and is blocked off before reaching the house foundation. The small historic trash scatter with aqua, colorless, and brown glass fragments, and fragmented ceramics may be contemporaneous with the extant residence, although the use of aqua-colored glass pre-dates the house construction.

Figure 7. 4105 Starlight Lane House Foundations, looking south.

Feature 1 is the 4105 Starlight Lane house foundation. Is approximately 40 feet by 70 feet in size and an associated concrete driveway pad measures approximately 40 feet by 25 feet. The perimeter house foundation consist of 6-inch-wide poured concrete with rebar.

The tax assessor's website states that the structure was a single-family 5-bedroom, 2.5-bath house with approximately 2,300 ft^2 of living space witha 572 ft^2 garage and fireplace. Additional construction elements consist of a concrete set of stairs to the yard on the northwest side of the parcel, a set of brick steps on the south side of the foundation, and a brick porch foundation wall to the east. A pile of large concrete rubble is in the middle of the west side of the house foundation and a circular fire pit made from smaller chunks of concrete and brick was created in the middle of the foundation. Three large chunks of the brick chimney are located to the north of the driveway pad. A domestic well and pressure tank are located on a 10-foot by 8-foot brick-lined concrete pad is located at the northeast corner of the driveway. The east side of the house has a wire fence running parallel to the house and property line. Landscaping includes *vinca*, Italian cypress (*Cupresses sempervirens*), and decorative bushes around the house. Currently, the foundations are overgrown with star thistle, grasses, poison oak, blackberry, and other disturbance-loving early colonizers.

Feature 2 is the remains of Starlight Lane, which is paved with asphalt and extends from Brace Road. Overall the lane is approximately 20 feet wide by 400 feet in length. Starlight Lane appears on the 1967 USGS topographic map and was most likely constructed at the same time as the house. The road is no longer in use, has been roped off at the end of the apartment building parking lot, and is mostly overgrown.

Feature 3 is a light distribution of historic refuse, measuring approximately 63 feet east to west by 30 feet north to south, and is located 115 m southwest (255 degrees) of the southwest corner of the house. Observed refuse consists of aqua, colorless, and brown glass fragments, white glazed stoneware fragments, a metal pipe segment, large glazed ceramic fragments, a light bulb base, a Hamm's pull-tab beer can, and milled lumber. The trash scatter was identified in freshly disturbed heavy equipment tracks. It is possible that additional artifacts exist between the house and those found, but were obscured by heavy ground cover. The use of aqua glass (c. 1850–1920s) pre-dates the construction of the house in the 1960s, but other elements appear to be contemporaneous with the residence.

NRHP/CRHR Assessment

NRHP/CRHR assessment is based upon establishing a theme's background. However, this information does not necessarily make the theme significant, nor are the associated resources necessarily considered eligible for listing in the NRHP/CRHR. Rather, the significance of the theme, including structural remains, roads, and refuse deposits, must be established at the local, state, or national level by the context. The following NRHP/CRHR assessment of the residential remains and loosely associated refuse deposit (Features 1, 2, and 3) are based upon the theme of residential development and lifeways during the mid to late 1900s.

While Feature 1, the residential foundation and associated concrete pad, and ancillary elements, are in their original location during the period of significance (the middle 1900s), and the setting appears to convey its historic feeling or function, subsequent demolition significantly impairs the quality of the historic fabric (design, materials, and workmanship) of the resource. Neither the house or concrete pad and associated ancillary remains at 4105 Starlight Lane are associated with important people or events (NRHP Criteria A and B, CRHR Criteria 1 and 2). Further, the remaining foundation and associated residential remains have no distinctive characteristics of construction nor do they appear to represent the work of an important or creative individual (NRHP Criterion C, CRHR Criterion 3). There is no evidence of artifacts directly associated with the remains that possess potential data that can contribute to a further understanding of residential development (Criterion D/4). Therefore, Feature 1 does not contribute to the NRHP/CRHR eligibility/significance of the site.

To be eligible under Criterion A/1, Starlight Lane (Feature 1) does not appear to be related to a transportation route that is historically significant to the development within the region. In addition, the road is/was not a primary route from one historically significant location to another that would qualify the route as eligible under Criterion A/1. In addition, the route is not associated with individual groups or individuals (Criterion B/2). Nor does the route

display unique features or engineered elements that would qualify it as eligible under Criterion C/2, or associated archaeological deposits that would significantly add to an understanding of construction techniques during the middle 1900s (Criterion D/4). Therefore, Starlight Lane does not appear to contribute to the NRHP/CRHR eligibility/significant.

Refuse scatters, such as Feature 3, represent limited dumping event or events associated with one or more of the themes and are assessed for their NRHP/CRHR eligibility/significance based upon their potential for contributing information that might be unavailable through documentary or other sources. These resources are therefore assessed for eligibility/significance based upon their archaeological value (Criterion D/4). Deposits with the least potential for important information are those that represent an accumulation of artifacts from a wide variety of sources over a long period of time, or that lack a clear association with a particular theme.

In addition, the general configuration of the debris scatter should remain as when the items were discarded, and new or modern materials should not be present. This may be the most significant element of integrity for refuse scatters, since information potential relating to domains such as chronology may be obscured by deposition of modern artifacts. Accordingly, unassociated historic artifact scatters are most likely not eligible for inclusion in the NRHP or CRHR. While the location and content of the refuse suggests that it may be associated with the residence, it consists of utilitarian items that lack the potential to further an understanding of mid 1900s lifeways that are well documented elsewhere, and as such does not appear to contribute to the eligibility of the site for inclusion in the NRHP/CRHR under Criterion D/4.

Also, none of the features appear to be a historic resources for the purposes of CEQA using the criteria outlined in Section 5024.1 of the California Public Resources Code, and evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines.

In summary, this site is not considered eligible for listing in the NRHP or CRHR.

5.1.3.2 ISOLATED FINDS

Two isolated ground stones (Figure 8) were found in a recently disturbed heavy equipment track in a fallow field. No evidence of midden soil, bedrock milling features, or other artifacts were noted. Ground stone 1 is a possible chopper or mano fragment and measures 11.5 cm long by 11.5 cm wide by 5.5 cm thick. Ground stone 2 (Figure 8, on the right) appears to be an unshaped mano and measures 14.6 cm long by 8.1 cm wide and 4.2 cm thick. Due to the lack of context or association with other evidence of prehistoric cultural activity, these artifacts are not considered eligible for listing in the NRHP/ CRHR and are not considered a unique archaeological resource.

Figure 8. Isolated groundstone fragments.

6 CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

Potential effects on sites that are currently listed or potentially eligible for listing in the NRHP or CRHR are considered significant and must be mitigated to the extent feasible. On the basis of the eligibility of the resources, a finding of **no historic properties affected** is recommended.

Although survey methods were developed to identify resources that may be located in the APE, it is possible that unidentified cultural deposits are present in shallow subsurface contexts. Subsurface prehistoric resources may take the form of stone tools or tool fragments, rock concentrations, burned and/or unburned shell or bone, and/or darkened midden sediments containing some of the above-mentioned constituents. Historic deposits include fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains, such as building foundations and dumps. Given the potential for subsurface deposits, it is recommended that if undocumented resources are encountered during construction, all destructive work in the vicinity of the find should cease until a qualified archaeologist can assess the significance of the find and, if appropriate, provide recommendations for treatment.

In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor and/or the project proponent shall immediately halt potentially damaging excavation in the area of the burial and notify the Placer County Coroner and a professional archaeologist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC within 24 hours of making that determination (Health and Safety Code Section 7050[c]).

Following the coroner's findings, the archaeologist and the NAHC-designated Most Likely Descendant (MLD) shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The MLD shall have 48 hours to complete a site inspection and make recommendations after being granted access to the site. A range of possible treatments for the remains, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendants, or other culturally appropriate treatment may be discussed. Site protection measures undertaken by the property owner may include one or more of the following:

1. Record the site with the NAHC or the appropriate information center.
2. Utilize an open-space or conservation zoning designation or easement.
3. Record a document with the county in which the property is located.

The landowner or their authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. If the NAHC is unable to identify an MLD or the MLD fails to make a recommendation within 48 hours after being granted access to the site, the landowner or their authorized representative may also reinter the remains in a location not subject to further disturbance if they reject the recommendation of the MLD and mediation by the NAHC fails to provide measures acceptable to the landowner.

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Appendix G Geotechnical Report

COSTCO WHOLESALE

GEOTECHNICAL INVESTIGATION SUMMARY CHECKLIST

General Information

Costco Wholesale Real Estate Main Contact: Michael Okuma

Geotechnical Main Contact: Andrea Traum, Kleinfelder

Geotechnical Engineer of Record: Brian Crystal, Kleinfelder

Project Location

CW #: 16-0132

Warehouse #:

Report Date: March 24, 2017

Consultant Project/Document Number: 20173273.001A

Addendums (List):

Report Purpose: ☐ Preliminary ■ Draft ☐ Final ☐ Addendum/Revision

Geotechnical Investigation Summary Checklist	Yes	No or NA	Describe / Comments	Report Section
Pre-existing Conditions / Information				
Developer provided geotechnical report (describe):	☐	■		
Pre-existing development (describe)	☐	■		
Foundation type (describe):	☐	■	Shallow spread footings	
Performance Issues (describe):	☐	■	Potential soils issues include shallow bedrock and gravel and cobbles in near surface onsite soils	
Environmental Issues (describe)	☐	■	Not addressed in this report	
Site Grading Records (stripping, compaction test results, field reports, etc.)	☐	■	No records available. Test pit excavations should be recompacted during construction	
Typical Building Structural Design Criteria				
Other (describe): Fuel facility				1.1
Building size (describe): 150,000 sq ft warehouse				1.1
Typical wall loading				
3,000 pounds per linear foot (1361 kilograms per 0.31 m) for Metal Buildings	☐	■		
4,500 pounds per linear foot (2041 kilograms per 0.31 m) CMU or pre-cast	■	☐	Shallow spread foundations	1.1
Typical column loading				
120,000 pounds (54430 kilograms) in non-snow regions	■	☐		1.1

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COSTCO WHOLESALE

GEOTECHNICAL INVESTIGATION SUMMARY CHECKLIST

Geotechnical Investigation Summary Checklist	Yes	No or NA	Describe / Comments	Report Section
150,000 pounds (68040 kilograms) in snow regions	☐	■		
Typical canopy loading: 50,000 pounds (22680 kilograms)	■	☐		1.1
Typical floor slab loading				
500 pounds per square foot (24 kPa), (psf, total)	■	☐		1.1
250 pounds per square foot (12kPa) (dead) at rack areas	■	☐		1.1
150 pounds per square foot (7.2kPa) (dead) at non-rack areas	■	☐		
350 pounds per square foot (16.8kPa) (live)	■	☐		1.1
Paving Design (twenty (20) year life)				
Heavy Duty paving shall accommodate thirty (30) trucks per day (Traffic Index of 7.0)	■	☐	5.0 AC/12.0 AB (MS-1) 5.0 AC/10.0 AB (Caltrans)	4.8.2
Light Duty paving shall Accommodate 6,600 cars per day (Traffic Index of 5.0)	■	☐	4.0 AC/6.0 AB (MS-1) 3.5 AC/6.0 AB (Caltrans)	4.8.2
Performance Grade (PG) binder oil identified for local climate conditions	■	☐	PG 70-10	4.8.3
Site Grading Conditions/Assumptions				
Deviations to Typical Criteria (list / describe):	■	☐	Gravel, cobbles, and shallow bedrock may impact excavations for foundations and utilities. Cut/fill building pad may require overexcavation of cut portion of pad for uniform foundation support. FFE will affect cut/fill recommendation	5.2
Design Finished Floor Elevation (FFE) (describe):	■	☐	The provided FFE is Elevation 331.50.	1.1
Basis for FFE (assumed, per Civil) (describe):	■	☐	Kier & Wright Civil Engineers & Land Surveyors, Inc., dated March 6, 2017.	1.1
Effects of change to assumed FFE (describe):	■	☐	The amount of cut/fill transition will depend on the FFE. A lower FFE may decrease the amount of cut/fill transition	1.1
Maximum anticipated cuts (describe):	■	☐	5-10 feet for building pad and utilities and 20 feet USTs	1.1, 5.2
Maximum anticipated fills (describe):	■	☐	5-10 feet for warehouse pad	1.1, 5.2
Cross sections prepared for sites that are not essentially flat	■	☐	Cross section on Figures 3, 4, and 5	Figures 3, 4, 5
Amount of import / export anticipated (describe):	☐	■	unknown	
Frost Depth (describe):	☐	■		
Retaining walls				
Number of walls (describe):	☐	■	unknown	
Height / Length of walls (describe):	☐	■	unknown	
Wall construction / type (describe):	☐	■	unknown	
Cut / fill transition in pad (describe):	■	☐	5-10 feet cut/fil	5.2

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COSTCO WHOLESALE

GEOTECHNICAL INVESTIGATION SUMMARY CHECKLIST

Geotechnical Investigation Summary Checklist	Yes	No or NA	Describe / Comments	Report Section
Offsite Improvements (describe)	☐	■	Not available. Will be addressed in final report	
Fieldwork / Results				
Due Diligence Design Criteria				
Version (describe): 1	■	☐	CWDR, Version 2016, September 19, 2016	1
Followed Criteria?	■	☐	yes	1
Deviations to standard investigation (describe):	■	☐	Infiltration testing could not be performed due to excessive rains and perched water condition and was removed from the scope of work	1
Groundwater				
Depth (describe):	■	☐	Regional groundwater greater than 50 feet,	3.3
Perched	■	☐	Perched groundwater observed above bedrock as shallow as 1 foot below surrounding grade	3.3
Expected seasonal fluctuation (describe):	■	☐	Can fluctuate based on precipitation	3.3
Piezometers installed?	☐	■		
Unusual / Challenging Soils conditions encountered				
Moisture-sensitive soils	☐	■	Not encountered	3.4.4
Undocumented fill	☐	■	Not observed	
Unsuitable soils (require removal)	■	☐	Cobbles in onsite soils	5.2.7
Wet soils	■	☐	Site is currently very wet to due to recent rainfall	3.3
Debris	☐	■		
Bedrock / potential non-rippable conditions	■	☐	Bedrock was encountered in the explorations.	1.2.2/ 3.2
Refusal	■	☐	Refusal with the drilling and excavation equipment was observed between depths of 7 to 22 feet.	1.2.2/ 3.2
Collapsible soils	☐	■		
Expansive soils	☐	■		
Compressible soils	☐	■		
Liquefaction	☐	■		3.4.3
Sinkholes	☐	■		
Other (describe):	☐	■		
Potential Contamination Identified				
Soil	☐	■	Not addressed in this report	
Groundwater	☐	■	Not addressed in this report	

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COSTCO WHOLESALE

GEOTECHNICAL INVESTIGATION SUMMARY CHECKLIST

Geotechnical Investigation Summary Checklist	Yes	No or NA	Describe / Comments	Report Section
Restoration of Disturbed Areas				
Backfilled with soil	■	☐	Test pits and borings outside the warehouse footprint were backfilled with soil. Test pits excavations should be recompacted during construction	1.2.2
Backfilled with grout	■	☐	Borings within the warehouse footprint were backfilled with grout.	1.2.2
Other (describe):	☐	■		
Topsoil samples collected / analyzed	■	☐	Lab results are presented in Appendix B	App B
Corrosivity testing performed/addressed	■	☐	Addressed in Section 4.9 and laboratory tests in Appendix B	4.9
Report				
Executive summary	■	☐		
Wet weather construction recommendations	■	☐	Provided in Section 5.3	5.3
Pad winterization/pad recommendations	☐	■		
Frost protection recommendations	☐	■		
Haul road recommendations	☐	■		
Site-specific best earthwork practices	■	☐	Discussed in executive summary and Section 5.2.1	5.2.1
Design Parameters				
Fill material parameters provided				
Structural fill (below foundations, slabs)	■	☐	Discussed in executive summary and Section 5.2.1	5.2.1
Site grading fill (below pavements, flatwork)	■	☐	Discussed in executive summary and Section 5.2.1	5.2.1
Select backfill (behind truck dock walls, foundations, grade beams, etc.)	■	☐	Discussed in executive summary and Section 5.2.1	5.2.1
Trench backfill	■	☐	Discussed in executive summary and Section 5.2.8	5.2.8
Drainage fill	☐	■		
Frost resistant fill	☐	■		
Slab base aggregate	■	☐	Discussed in executive summary and Section 4.4	4.4
Limits of debris / unsuitable removal provided	☐	■		
Over-excavation / recompaction required				
Depth (describe):	■	☐	Cut/fill pad transition; 24-inches. Oversize cobbles can be removed from excavation areas	5.2.2
Extent (include cross-section diagram)	■	☐	10' outside building pad, limits based on pad elevation	5.2.2
Pad subgrade stabilization required (describe):	☐	■		

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COSTCO WHOLESALE

GEOTECHNICAL INVESTIGATION SUMMARY CHECKLIST

Geotechnical Investigation Summary Checklist	Yes	No or NA	Describe / Comments	Report Section
Surcharge				
Height (describe):	☐	■		
Lateral extent (describe):	☐	■		
Estimated duration (describe):	☐	■		
Shallow Foundations				
Pounds per square foot (kPa per m) allowable soil bearing pressure (describe):	■	☐	3,000 psf	4.3.2
Deep Foundations				
Type (describe):	■	☐	Drilled piles for light and other poles	4.3.3
Options and Value Engineering Matrix provided	☐	■		
Floor Slabs				
Unreinforced (>2500 pound per square foot) (>120 kPa)	■	☐		4.4
Reinforced (describe why)	☐	■		
Subgrade modulus (pounds per square inch per inch (kPa / mm) (describe):	■	☐	125 pci	4.4
Base Material thickness (minimum six (6) inch (152.4 mm)) (describe):	■	☐	6 inches minimum	4.4
Seismic Conditions				
Governing Building Code (IBC, UBC, other)	■	☐	2016 California Building Code	4.2
Geologic Hazard Identified	■	☐		3.4
Proximity to earthquake fault zone(s)	■	☐	Foothills Fault System 8 miles from site	3.4.1
Proximity to seismic hazard zone(s)	☐	■		3.4.1
Potential for liquefaction	☐	■		3.4.3
Potential for lateral spreading	☐	■		3.4.3
Potential for seismic settlement	☐	■		3.4.3
Potential for slope stability/landslides	☐	■		3.4.2
Potential for ground shaking or geologic hazards	■	☐	Moderate ground shaking from distant faults	3.4.3
Retaining Walls	■	☐		4.7
Recommended Wall Types	☐	■	unknown	
Recommend Kleinfelder Design	☐	■		
Lateral earth pressure design values				
Active:	■	☐	40 pcf equivalent fluid weight	4.7
At-rest:	■	☐	60 pcf equivalent fluid weight	4.7
Passive:	■	☐	250 pcf equivalent fluid weight	4.7
Seismic:	■	☐	8 pcf equivalent fluid weight	4.7

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COSTCO WHOLESALE

GEOTECHNICAL INVESTIGATION SUMMARY CHECKLIST

Geotechnical Investigation Summary Checklist	Yes	No or NA	Describe / Comments	Report Section
Backfill material, placement requirements	■	☐	On-site sandy (nonexpansive) backfill behind walls; placed per structural fill section	4.7
Drainage requirements and cross-section drawing	■	☐	Cross sections of site shown on Figures 3, 4, and 5	4.6, Figures 3, 4, 5
Finger Drains				
Required for frost	☐	■		
Recommended for long term maintenance and constructability	■	☐		4.6
Pavement				
Pavement subgrade stabilization required (describe):	☐	■		
Asphalt mix design specified	■	☐	Per Costco Wholesale Specifications Section 09	5.5
Heavy and light duty pavement sections specified	■	☐	Table 4 in report	4.8
Alternative pavement sections identified	■	☐	Recommendation for PCC pavement are in Table 5	4.8
Specification for offsite pavement sections included	☐	■	Offsite improvements not addressed in this report. They will be addressed in Final report.	
Light Pole Foundations (accounting for frost action)	■	☐		4.3.3
Data Gaps / Unknowns (describe):	☐	■		

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March 24, 2017
Kleinfelder Project No. 20173273.001A

Costco Wholesale
9 Corporate Park, Suite 230
Irvine, California 92606

Attention: Mr. Michael Okuma
Director of Real Estate Development

SUBJECT: DRAFT Geotechnical Study
Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

Dear Mr. Okuma:

Kleinfelder is pleased to present this report summarizing our geotechnical study for the proposed Costco Wholesale Warehouse located southeast of the intersection of Sierra College Boulevard and Brace Road in Loomis, California. The site is currently very wet as a result of heavy rainfall causing perched groundwater near the ground surface and the planned infiltration tests could not be performed. However, based upon subsurface soil conditions, these tests are no longer considered necessary and, therefore, will not be performed. The conclusions and recommendations presented in this report are subject to the limitations presented in Section 7.

We appreciate the opportunity to provide geotechnical engineering services to you on this project. If you have any questions regarding this report or if we can be of further service, please do not hesitate to contact Andrea Traum at 408.595.3275, or Andy Franks, Kleinfelder's Client Account Manager for Costco, at 480.650.4905.

Sincerely,

KLEINFELDER

DRAFT

Rebecca L. Money, PE, GE
Senior Geotechnical Engineer

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Andrea Traum, PE
Senior Project Manager

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DRAFT GEOTECHNICAL STUDY
PROPOSED COSTCO WHOLESALE WAREHOUSE
SIERRA COLLEGE BOULEVARD AND
BRACE ROAD
LOOMIS, CALIFORNIA
CW# 16-0132
KLEINFELDER PROJECT NO. 20173273.001A

MARCH 24, 2017

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A Report Prepared for:

Mr. Michael Okuma
Costco Wholesale
9 Corporate Park, Suite 230
Irvine, California 92606

DRAFT GEOTECHNICAL STUDY
PROPOSED COSTCO WHOLESALE WAREHOUSE
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
LOOMIS, CALIFORNIA
CW# 16-0132
MG2# 16-5254-01

Prepared by:

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Rebecca L. Money, PE, GE
Senior Geotechnical Engineer

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March 24, 2017
Kleinfelder Project No. 20173273.001A

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can

construction project.

Geotechnical-Engineering Services Are Performed for

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation*.

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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EXECUTIVE SUMMARY

This report presents the results of our geotechnical study for the proposed Costco Wholesale Warehouse (CW# 16-0132) located southeast of the intersection of Sierra College Boulevard and Brace Road in Loomis, California. The purpose of our study was to evaluate soil and groundwater conditions beneath the site and provide geotechnical recommendations for design and construction. We based our study on the Costco Wholesale Development Requirements (CWDRs), Version 2016, dated September 19, 2016. The site is currently very wet with perched groundwater near the ground surface and the planned infiltration tests could not be performed. However, based upon subsurface soil conditions, these tests are no longer considered necessary and, therefore, will not be performed.

Kleinfelder understands Costco plans to develop an approximately 18-acre site to construct a new, approximately 150,000-square-foot warehouse and fuel facility. The warehouse building will be a single-story, steel-framed structure (30 feet in height) with concrete masonry unit and metal walls. The fuel facility will contain 24 fueling locations, three underground storage tanks (USTs), a diesel UST, a fuel additive UST, four fueling islands, and a pre-manufactured metal canopy.

The building surroundings will consist mainly of surface parking with some landscape areas. Based on the CWDRs, we understand maximum column loads will be on the order of 120 kips, typical wall loads will be approximately 4.5 kips per lineal foot, canopy column loads will be approximately 50 kips, and the total slab load (dead plus live loads) will be approximately 500 psf.

Surface elevations interpreted from a preliminary grading plan prepared by Kier & Wright Civil Engineers & Land Surveyors, Inc., undated, indicate that existing surface elevations vary from a high of approximately Elevation 340 feet (datum not provided) in the south-eastern portion of the site to a low of approximately Elevation 320 feet in the north-western portion of the site. According to the preliminary grading plan, we understand that the finished floor elevation (FFE) for the warehouse will be established at approximately Elevation 331.50 feet. Based on the preliminary grading plan and approximate surface elevations, the warehouse building pad area will be raised as much as approximately 10 feet and cut as much as about 5 feet. The fuel facility area will be raised approximately 1 to 5 feet.

At the time of our field exploration, much of the site was undeveloped and covered by native grass and weeds with scattered clusters of trees. A foundation and miscellaneous improvements associated with a former residence is located on the northwest corner of the property. A concrete

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box culvert crosses Sierra College Boulevard with a drainage swale flowing on the west border of the site and crosses near the southwestern corner of the proposed Costco warehouse pad. A concrete pipe was encountered near the former residence in Test Pit TP-7 at a depth of approximately 7 feet. It is unknown if this utility pipe is in use.

Subsurface conditions at the site were explored by drilling 38 borings, excavating 10 test pits, and performing a seismic refraction survey. The seismic refraction survey consisted of six 230-foot long seismic lines located within/across the warehouse footprint and fuel facility. A total of 21 borings and 5 test pits were drilled/excavated in the warehouse building area; 13 borings and 3 test pits were drilled/excavated in the parking and drive areas; and 4 borings and 1 test pit were drilled/excavated in the fuel facility area. The borings were drilled using track-mounted hollow-stem-auger drilling and HQ-3 rock coring equipment to depths between approximately 7 and 30 feet below the existing ground surface (bgs) in the warehouse building area; approximately 10 feet bgs in the parking and drive areas; and between approximately 10 and 30 feet bgs in the fuel facility area. Seventeen of the borings (Borings B-1, B-4, B-6 through B-10, B-12 through B-19, B-22, and B-23) were terminated short of their planned depth due to practical auger refusal on bedrock. Eight of these borings that encountered refusal were cored to a depth of at least 4 feet into the bedrock (Borings B-4, B-7, B-9, B-17 through B-19, B-22, and B-23). Ten test pits were excavated to depths ranging from approximately 8 feet to 15 feet bgs. Five of these test pits were terminated short of their planned depth due to practical refusal on bedrock (Test Pits TP-2, TP-3, TP-7, TP-9, and TP-10). All test pits were backfilled with soil cuttings and borings were backfilled with neat cement grout or soil cuttings.

Perched water was encountered in a majority of our borings and test pits as shallow as 1 foot. Portions of the site had ponded surface water with small stream flowing through the low area in the middle of the site to a culvert beneath Sierra College Boulevard. This surface water infiltrated the near surface soils, collected on less permeable soil and rock at shallow depth, was observed seeping into the test pit excavations, and was encountered in the soil borings at various depths. The approximate locations of the borings and test pits are presented on Figure 2, Exploration Location Plan.

The soils across the site generally consist of loose to very dense sands with varying amounts of silt and clay. These sand soils are residual soils generated from weathering of the underlying granite bedrock. Gravel to cobble-sized rock fragments were commonly encountered below approximately 5 feet. Many of the soil samples exhibited faint bedrock structure typical of

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decomposed rock. The heterogeneous depth to bedrock encountered is typical of a granitic bedrock weathering profile. Due to bedrock fracture, weathering environment, and mineral composition, the bedrock surface can weather to soil at varying rates and depths resulting in an inconsistent bedrock surface. The bedrock encountered is consistent with the quartz diorite mapped by Olmsted (1971).

Based on the results of our field exploration, it is our professional opinion that the proposed project is geotechnically feasible, provided the recommendations presented in the geotechnical report are incorporated into the project design and construction. We identified the following key geotechnical considerations during our study.

- The proposed Costco warehouse building and fuel facility may be supported on a conventional shallow foundation system. Based on the preliminary grading plan, the warehouse building footprint is situated on a cut/fill transition with fills up to approximately 10 feet in the south-western corner of the building and cuts up to about 5 feet in the south-eastern corner. Overexcavation and recompaction of on-site soils/weathered bedrock is recommended to reduce the potential for differential settlement and provide relatively uniform support for the proposed warehouse and other improvements.

- Soils within 10 feet laterally of the warehouse pad (including the entrance canopy, building aprons, utility pads, stairs, ramps, stoops, and the loading dock) should be overexcavated to a depth of at least 2 feet below existing grade, 3 feet below the bottom of the footings, or 3 feet below the bottom of the floor slabs, whichever is deeper. If existing fill soils are encountered at the base of the overexcavation, the overexcavation should continue until the fill is removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill.

- Gravel to cobble-sized rock fragments generated from weathering of the underlying granite bedrock were commonly encountered below approximately 5 feet and may impact excavations for foundations and utilities in the building pads and site. Depth to refusal in the soil borings and test pits ranged between 7 and 20 feet. The seismic refraction survey results (see Appendix C) indicate variability in depth to bedrock across the warehouse and fuel station sites and a general depth of rippability of approximately 12 feet. It should be noted that the depth to less weathered rock is highly variable and difficult excavation,

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which may require blasting, may be encountered at shallower depths. Further discussion is provided in Section 5.2.5.

- Rock or other soil fragments greater than 6 inches in size should not be used in fills. Within the upper 3 feet of building pads, rock or other soil fragments greater than 3 inches in size should not be used. Screening of oversized materials will be necessary to reuse the on-site material as structural fill. It is also likely that deeper onsite excavations may generate oversized material that will need to be disposed of off-site.

- For pavement, sidewalk, and other flatwork areas (including the fuel facility), soils should be overexcavated to a depth of at least 18 inches below existing grade. Overexcavation is not required in cut areas provided loose/soft shallow soils and organic rich materials are removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The over-excavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.

- Rainfall will infiltrate near surface soils and collect on less permeable soil and rock at shallow depth. Therefore, the contractor will likely encounter shallow perched groundwater in excavations, particularly in the northern half of the site and the northern portion of the fuel facility following rainfall events and in the winter and spring months. During a large portion of our field work, a majority of the entire site was not drivable using trucks and truck mounted equipment due to multiple rainfall events passing through the area. The perched groundwater will likely be present at or near subgrade level across the entire site during and after rainfall events. Temporary and permanent drainage provisions will likely be required for these areas as discussed in Section 5.2.3

- Fill soils should be compacted to at least 95 percent of the maximum dry unit weight (ASTM D1557) in accordance with the Costco Wholesale Development Requirements (CWDRs). Fill soils should be compacted to moisture contents between -2 and +1 percent of the optimum moisture content during compaction. If both compaction and moisture content criteria are not within the specified tolerances, the fill should not be accepted, and the contractor should rework the material until the fill is placed within the specified tolerances.

- Import soils should have no particles greater than 3 inches in maximum dimension, no less than 70 percent of the particles passing the No. 4 sieve, no more than 25 percent of

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the particles passing the No. 200 sieve, and a Plasticity Index (PI) less than 5. The contractor should provide documentation that all imported soil is free of hazardous materials, including petroleum or petroleum byproducts, chemicals and harmful minerals. Test results with the geotechnical and analytical properties of the proposed import material should be provided to Costco for approval prior to transportation and use on site.

- The site soils contained approximately 25 to 30 fines and are moisture sensitive and susceptible to disturbance, rutting, and pumping during construction. The contractor should plan to repair subgrade conditions that become unstable/disturbed and should develop a plan to manage subgrade trafficability across the site throughout the construction period. Features of this plan may include temporary surface haul roads, limited traffic routes, etc.

- Should grading be performed during or following extended periods of rainfall, the moisture content of the near-surface soils will be significantly above the optimum moisture content. These conditions could seriously impede grading by causing an unstable subgrade condition. Typical remedial measures include deep scarification and drying, removal and replacement with crushed rock and geotextile fabric, and/or treatment with portland cement.

- Pursuant to current Costco Wholesale standard construction design practices, we have evaluated the necessity of using a steel-reinforced slab. Based on the geotechnical characteristics of the site, the proposed warehouse can be built with a non-reinforced slab.

- Kleinfelder typically recommends installation of a vapor barrier beneath the slab to mitigate potential moisture issues such as flooring performance and mold. However, we understand that Costco Wholesale has determined that moisture barriers are not to be used in construction of Costco Wholesale warehouses due to adverse effects on concrete curing and performance. Therefore, we have provided construction recommendations for the Costco warehouse that does not include installation of a moisture barrier with the understanding that there will be an increased risk for adverse moisture issues.

- Due to a poor draining subgrade as a result of near surface bedrock, we recommend installing perimeter foundation drains for the warehouse building and radial finger drains below new pavement sections. Additionally, planters should be detailed such that water exiting from them will not seep into the foundation areas or beneath slabs and pavement.

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- The Placer County, California currently uses the 2016 California Building Code (CBC) as the governing code.

- Based on our field exploration and understanding of the regional geology, we classify the site as Seismic Site Class C, Soft Rock.

- Performance Grade (PG) Binder oil of 70-10 may be used asphalt concrete pavements.

- The minimum resistivity of the samples tested indicate that the soil may be mildly corrosive towards ferrous metals (NACE, 2006). The concentrations of soluble sulfates indicate that the subsurface soils represent a Class S0 exposure to sulfate attack on concrete in contact with the soil based on ACI 318 Table 4.2.1 (ACI, 2011). Therefore, in accordance with ACI Building Code 318-11, no special provisions for selection of cement type are required.

- We have assessed the potential for storm water infiltration into the subgrade soils at the subject project site based on soil type and laboratory testing. The onsite soils in the upper 10 to 20 feet below the existing ground surface at the site are comprised primarily of clayey and silty sand. Seasonal perched groundwater was also observed within these sandy soils above the bedrock. Given the moderate infiltration capacity of the on-site soils and observed perched groundwater, we recommend alternatives to infiltration Best Management Practices (BMPs), such as bio-filtration/bio-retention systems (bio-swales and planter boxes), be implemented at the project site.

The findings, conclusions, and recommendations presented in this executive summary should not be relied upon without consulting our geotechnical report for more information. The conclusions and recommendations presented in this report are subject to the limitations presented in Section 7.

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1 INTRODUCTION

This report presents the results of Kleinfelder's geotechnical study for the proposed Costco Wholesale Warehouse (CW# 16-0132) located southeast of the intersection of Sierra College Boulevard and Brace Road in Loomis, California. The location of the project site is presented on Figure 1, Site Location Map. The purpose of our geotechnical study was to evaluate soil and groundwater conditions at the site and provide geotechnical recommendations for project design and construction. The scope of our services was presented in our proposal titled, "Proposal for Geotechnical Study, Proposed Costco Wholesale Warehouse, Sierra College Boulevard and Brace Road in Loomis, California, CW# 16-0132, MG2# 16-5254-01," dated December 14, 2016. We based our study on the Costco Wholesale Development Requirements (CWDRs), Version 2016, dated September 19, 2016. The site is currently very wet with perched groundwater near the ground surface and the planned infiltration tests could not be performed. However, based upon subsurface soil conditions, these tests are no longer considered necessary and, therefore, will not be performed.

This report presents a description of the services performed, a discussion of the geotechnical conditions observed at the site, and recommendations developed from our engineering analyses of field and laboratory data. Individuals using this report should read the limitations presented in Section 7.

1.1 PROJECT DESCRIPTION

Kleinfelder understands Costco plans to develop an approximately 18-acre site to construct a new approximately 150,000-square-foot warehouse, fuel facility, and parking lots. The warehouse building will be a single-story, steel-framed structure (30 feet in height) with concrete-masonry-unit (CMU) and metal walls. The fuel facility will contain three underground storage tanks (USTs), a diesel UST, a fuel additive UST, four fueling islands, and a pre-manufactured metal canopy. The building surroundings will consist mainly of surface parking with some landscape areas.

Based on the CWDRs, we understand maximum column loads will be on the order of 120 kips, typical wall loads will be approximately 4.5 kips per lineal foot, canopy column loads will be approximately 50 kips, and the total slab load (dead plus live loads) will be approximately 500 psf. Flood slab loading is anticipated to include 250 psf (total) at the rack areas and 350 psf (live). The warehouse surroundings will consist mainly of parking with a loading dock and some

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landscaped areas. Parking and driveway areas will be paved with either portland cement concrete or asphalt concrete pavements.

Based on our experience with fuel facilities in this area, the canopy for the service islands is typically founded on spread footings and the design is typically governed by overturning moments from wind loading. Typical column dead loads are anticipated to be approximately 4.5 kips and typical live loads are approximately 16 kips, which result in bearing pressures of less than 500 pounds per square (psf).

The 18-acre property is currently undeveloped and covered by native grass and weeds with scattered clusters of trees. An existing apartment complex is located immediately north of the property and a residential subdivision is located east of the property. Surface elevations interpreted from a preliminary grading plan prepared by Kier & Wright Civil Engineers & Land Surveyors, Inc., undated, indicate that existing surface elevations vary from a high of approximately Elevation 340 feet (datum not provided) in the south-eastern portion of the site to a low of approximately Elevation 320 feet in the north-western portion of the site. According to the preliminary grading plan, we understand that the finished floor elevation (FFE) for the warehouse will be established at approximately Elevation 331.50 feet. Based on the preliminary grading plan and approximate surface elevations, the warehouse building pad area will be raised as much as approximately 10 feet and cut as much as about 5 feet. The fuel facility area will be raised approximately 1 to 5 feet. We understand that fill material generated during grading of the site will be used to raise the site. Excavations for deep utilities and the loading dock may exceed 4 feet and installation of the USTs will require an excavation up to about 20 feet deep.

1.2 SCOPE OF SERVICES

The scope of our geotechnical study consisted of a literature review, subsurface explorations, geotechnical laboratory testing, engineering evaluation and analysis, and preparation of this report. Studies to assess environmental hazards that may affect the soil and groundwater at the site were beyond our geotechnical scope of services. The following paragraphs present a description of our services.

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1.2.1 Task 1 – Background Data Review

We reviewed readily-available published and unpublished geologic literature in our files and the files of public agencies, including selected publications prepared by the California Geological Survey and the U.S. Geological Survey. We also reviewed readily available seismic and faulting information, including data for designated earthquake fault zones as well as our in-house database of faulting in the general site vicinity.

1.2.2 Task 2a – Field Exploration (Soil Borings and Test Pits)

Subsurface conditions at the site were explored by drilling 38 borings and excavating 10 test pits. A total of 21 borings and 5 test pits were drilled/excavated in the warehouse building area; 13 borings and 3 test pits were drilled/excavated in the parking and drive areas; and 4 borings and 1 test pit were drilled/excavated in the fuel facility area. The borings were drilled using track-mounted hollow-stem-auger drilling with HQ-3 rock coring equipment used on selected borings to depths between approximately 7 and 30 feet below the existing ground surface (bgs) in the warehouse building area; approximately 10 feet bgs in the parking and drive areas; and between approximately 10 and 30 feet bgs in the fuel facility area. Seventeen of the borings (Borings B-1, B-4, B-6 through B-10, B-12 through B-19, B-22, and B-23) were terminated short of their planned depth due to practical auger refusal on bedrock. Eight of these borings that encountered refusal were cored to a depth of at least 4 feet into the bedrock (Borings B-4, B-7, B-9, B-17 through B-19, B-22, and B-23). Ten test pits were excavated to depths ranging from approximately 8 feet to 15 feet bgs. Five of these test pits were terminated short of their planned depth due to practical refusal on bedrock (Test Pits TP-2, TP-3, TP-7, TP-9, and TP-10). All test pits were backfilled with the excavated soil. Borings in the warehouse building area and tank excavation area were backfilled with neat cement grout and the remaining shallower borings were backfilled with the soil cuttings. The approximate locations of the borings and test pits are presented on Figure 2, Field Exploration Location Plan.

Prior to commencement of the fieldwork, Underground Service Alert (USA) was notified and various geophysical techniques were used at the boring and test pit locations to identify potential conflicts with subsurface structures. A Kleinfelder staff engineer supervised the field operations and logged the explorations. Selected bulk and drive samples were retrieved, placed in plastic bags or sealed in sample tubes, and transported to our laboratory for further evaluation. The number of blows necessary to drive a Standard Penetration Test (SPT) sampler or California-type sampler was recorded. Rock coring was performed in select borings using HQ-3 equipment when

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the target depth was not reached due to auger refusal on bedrock. Soil descriptions used on the logs result from field observations and data, as well as from laboratory test data. Stratification lines on the logs represent the approximate boundary between soil and/or rock types, and the actual transition may vary and can be gradual. Appendix A presents a description of the field exploration program, exploration logs, test pit logs, and a legend of terms and symbols used on the logs.

1.2.3 Task 2b – Field Exploration (Seismic Refraction Survey)

Advanced Geological Services under subcontract to Kleinfelder performed a geophysical seismic refraction survey of the proposed Costco warehouse building pad and fuel facility areas to evaluate the excavatability (rippability) of the granitic rock material. The methodology, equipment, field procedures, data processing, analyses and results are presented in a report dated February 13, 2017. A copy of the report is included in Appendix C.

1.2.4 Task 3 – Laboratory Testing

Laboratory testing was performed on representative bulk and relatively undisturbed samples to assist in soil classification and development of engineering parameters for geotechnical design. Laboratory testing was comprised of moisture content, dry unit weight, sieve analysis, wash sieve (percent passing No. 200 sieve), Atterberg limits, maximum laboratory density, and R-values, which were performed in our Sacramento laboratory. Corrosivity testing was performed by Sunland Analytical of Rancho Cordova, California. Appendix B presents the results of the laboratory testing performed for this study.

1.2.5 Task 4 – Geotechnical Analyses

We analyzed field and laboratory data in conjunction with the assumed finished grades, warehouse and fuel facility layout, and structural loads to provide geotechnical recommendations for design and construction. We evaluated feasible foundation systems, concrete slab support, pavement design, infiltration design (removed from the field investigation plan), and earthwork. Seismic design parameters in accordance with the 2016 California Building Code (CBC) are also presented.

1.2.6 Task 5 – Report Preparation

This report summarizes the services performed, data acquired, and our findings, conclusions, and geotechnical recommendations for the design and construction of the proposed improvements.

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Our report includes the following items:

- Vicinity map and field exploration location map showing the approximate boring, test pit, and seismic refraction line locations;
- Boring and test pit logs (Appendix A);
- Results of laboratory testing (Appendix B);
- Results of the seismic refraction survey (Appendix C);
- Discussion of general site conditions;
- Discussion of general subsurface conditions as encountered in our field exploration;
- Discussion of regional and local geology;
- Recommendations for seismic design parameters in accordance with Chapter 16 of the 2016 CBC;
- Recommendations for foundation design, allowable bearing pressures, embedment depths, and compatibility constraints under various loading conditions;
- Anticipated total and differential static settlements;
- Recommendations for site preparation, earthwork, temporary slope inclinations, fill placement, and compaction specifications, including the excavation characteristics of subsurface soil deposits and bedrock materials;
- Recommendations for support of floor slabs and slabs-on-grade;
- Recommendations for flexible and rigid pavement structural sections for light- and heavy-duty pavement based on Equivalent Single Axle loading presented in the CWDRs;
- Recommendations for design of retaining structures, including active and at-rest lateral earth pressures, passive and frictional resistance, and applicable surcharge loads; and
- Preliminary evaluation of the corrosion potential of the on-site soils.

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2 SITE CONDITIONS

2.1 SITE DESCRIPTION

The proposed Costco site is located southeast of the intersection of Sierra College Boulevard in Loomis, California, as shown on Figure 1. The site is currently bounded by residential properties and Brace Road to the north, Sierra College Boulevard to the west, vacant properties and existing commercial properties to the south, and residential properties to the east. At the time of our field exploration, the site was vacant and much of the site was covered by native grass and weeds with scattered clusters of trees. The project site is gently rolling with about 10 to 15 feet of relief across the site. A concrete box culvert crosses Sierra College Boulevard with a drainage swale flowing on the west border of the site and crosses near the southwestern corner of the proposed Costco warehouse pad. A foundation and miscellaneous improvements associated with a former residence is located on the northwest corner of the property. A concrete pipe was encountered near the former residence in Test Pit TP-7 at a depth of approximately 7 feet. It is unknown if this utility pipe is in use.

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3 GEOLOGY

3.1 GEOLOGIC SETTING

3.1.1 Regional Geology

The project site lies within the foothills of the Sierra Nevada Province just east of the western boundary of the adjacent Sacramento Valley (northern) portion of the Great Valley geomorphic province. About 400 miles long and 40 miles wide, the Great Valley is an asymmetrical, synclinal trough formed by tilting of the Sierran block, with the western side dropping to form the valley and the eastern side abruptly uplifted to form the Sierra Nevada Mountains. Great Valley sediments consist of a thick sequence of alluvial, basin, and plain sediments eroded from the Sierra Nevada Mountains and transported primarily by the Sacramento River and its tributaries.

The Sierra Nevada province is approximately 40 to 100 miles wide east to west and 400 miles long trending north to south and parallels the Great Valley Province to the west. The Sierra Nevada Mountains within the Sierra Nevada province are comprised primarily of large, north-south elongated blocks of Mesozoic granitic terrain (composed of numerous granitic intrusions) forming the backbone of California. Separating the Sierran granitic basement rocks from the Great Valley sediments is the northwest trending belt of metamorphosed volcanic rocks and sediments forming the western slopes (foothills) of the Sierra Nevada Mountains. These rocks are distributed within three major fault-bounded lithologic terrains that extend along the length of the metamorphic belt. Rocks within these terrains have been isoclinally folded and metamorphosed on a regional scale and represent a “collage” of tectonically accreted blocks emplaced during convergent plate tectonism that occurred during the late Paleozoic and early Jurassic. Bedding, foliation and major structural features throughout the metamorphic belt normally trend northwest and dip steeply to the east. The site is situated on a granitic intrusion within the metamorphic belt.

3.1.2 Site Geology

The site has been mapped by multiple geologists, the map that provides the most detail is by Olmsted at a scale of 1:48,000 (Olmsted, 1971). This map indicates the proposed Costco development is underlain by the Upper Jurassic/Lower Cretaceous (approximately 128 million years ago) granitic rock classified as a quartz diorite and mapped as the Penryn Pluton. The Penryn Pluton is one of numerous plutons that compose the Sierra Nevada Batholith and is characterized as relatively shallow intrusion, approximately 6 – 10 km deep. Quartz diorite is medium to coarse-grained porphorytic intrusive rock composed of plagioclase, quartz,

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hornblende, and biotite minerals. The Penryn Pluton has varying degrees of weathering and fracturing in the project area which generates a gradational and heterogeneous weathering profile. Weathering tends to be more intense along fractures in the rock, which can result in blocks of less weathered rock separated by deeper highly weathered areas along vertical fractures.

3.2 SUBSURFACE CONDITIONS

The soils across the site generally consist of loose to very dense sands with varying amounts of silt and clay. These sand soils are residual soils generated from weathering of the underlying granite bedrock. Gravel to cobble-sized rock fragments were commonly encountered below approximately 5 feet. Many of the soil samples exhibited faint bedrock structure typical of decomposed rock. Seventeen of the borings were terminated due to practical auger refusal and five of the test pits were terminated due to practical equipment refusal on granitic bedrock above the targeted depth of exploration. These explorations are summarized in Table 1. It is likely refusal occurred when the borings encountered moderately weather to slightly weathered bedrock. The heterogeneous depth to bedrock encountered is typical of a granitic bedrock weathering profile. Due to bedrock fracture, weathering environment, and mineral composition, the bedrock surface can weather to soil at varying rates and depths resulting in an inconsistent bedrock surface. The bedrock encountered is consistent with the quartz diorite mapped by Olmsted (1971). Descriptions of the deposits are provided in our boring and test pit logs presented in Appendix A. Generalized geotechnical cross sections are presented on Figures 3 through 5.

TABLE 1
EXPLORATION REFUSAL SUMMARY

Exploration Number	Location	Approximate Depth to Refusal (feet)	Approximate Elevation of Refusal (feet)
Boring B-1	Building Pad	14	314
Boring B-4	Parking Field	15^	315
Boring B-6	Building Pad	14 ½	311 ½
Boring B-7	Building Pad	15^	311
Boring B-8	Building Pad	17	313
Boring B-9	Building Pad	11^	322
Boring B-10	Building Pad	12	312
Boring B-12	Building Pad	12	318
Boring B-13	Building Pad	22	313
Boring B-14	Building Pad	7	315
Boring B-15	Building Pad	13	313

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TABLE 1
EXPLORATION REFUSAL SUMMARY (CONT.)

Exploration Number	Location	Approximate Depth to Refusal (feet)	Approximate Elevation of Refusal (feet)
Boring B-16	Building Pad	18	316
Boring B-17	Building Pad	12^	324
Boring B-18	Building Pad	7^	312
Boring B-19	Building Pad	13^	313
Boring B-22	Fuel Facility	16^	312
Boring B-23	Fuel Facility	20^	309
Test Pit TP-2	Building Pad	11	316
Test Pit TP-3	Building Pad	8	322
Test Pit TP-7	Parking Field	10	325
Test Pit TP-9	Parking Field	10	323
Test Pit TP-10	Parking Field	11	314

Note: ^ indicates rock coring was performed below the point of refusal.

3.3 GROUNDWATER

Permanent groundwater was not encountered in our borings or test pits, which were explored to a maximum depth of approximately 30 feet. Groundwater levels in the area have been measured at depths deeper than 50 feet below the existing ground surface. However, perched water was encountered in a majority of the explorations as shallow as 1 foot below site grade. This perched groundwater is likely a result of recent heavy rainfall and is seasonal in nature. This condition may occur on an annual basis and would depend upon regional precipitation.

Localized zones of perched water, increased soil moisture content and fluctuations of the groundwater level should be anticipated during and following the rainy season. Irrigation of landscaped areas on or adjacent to the site can also cause a fluctuation of local groundwater levels and result in a perched or shallow groundwater condition at the site.

3.4 ASSESSMENT OF POTENTIAL GEOLOGIC HAZARDS

3.4.1 Localized Faulting

The site is not located within the California Geologic Survey (CGS) designated Alquist-Priolo Earthquake Fault Zone, and no mapped active fault traces are known to project towards or transverse the site (Hart and Bryant, 2007, Jennings et al., 2010, USGS, 2016). Because there are no mapped active or potentially active faults in the general vicinity of the site, the potential for fault-related ground surface rupture at the site is considered low.

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Tectonically, the site is situated between major, fault systems including (from west to east) the San Andreas Fault System, Great Valley Fault Zone, Foothills Fault System, and Sierra Nevada Frontal Fault System that are responsible for the deformational history of California. Both the San Andreas and Sierra Nevada Frontal Fault Systems are well known for Holocene rupture that has continued into historical time and represent the source of most of California's seismic history. The Great Valley Fault Zone and the Foothills Fault System are more controversial in that only minor segments are suspected to have generated seismic activity in the recent geologic past and the frequency of rupture and/or seismic activity of each of these fault systems is considerably lower than the San Andreas and Sierra Nevada Frontal Fault systems. The closest of these fault systems to the subject sites is the Foothills Fault System, located about 8 miles east of the site. The Foothills Fault System consists multiple fault segments of which the Deadman, Maidu, Spenceville, and Rescue are the closest to the project site. The Foothills Fault System was generated by an eastward plate convergence and subduction between the late Paleozoic and early Mesozoic time (roughly 140 to 300 million years ago).

3.4.2 Landslides

Landslides and other forms of mass wasting, including mud flows, debris flows, soil slips, and rock falls occur as soil or rock moves down slope under the influence of gravity. Landslides are frequently triggered by intense rainfall or seismic shaking.

The site and surrounding area are relatively flat to gently sloping; therefore, landslides or other forms of natural slope instability do not represent a significant hazard to the project.

3.4.3 Liquefaction and Seismic Compression

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and/or undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confining pressure, depth to groundwater, and the intensity and duration of the seismic ground shaking. Liquefaction is most prevalent in loose to medium dense, silty, sandy, and gravelly soils below the groundwater table. Based on our review of available groundwater well data, it is our opinion that the regional groundwater is approximately 50 feet or deeper. Therefore, based on the depth to groundwater

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and shallow rock encountered in the subsurface explorations, the potential for liquefaction is not considered a hazard at the site.

Seismic compression results from the accumulation of contractive volumetric strains in unsaturated soil during earthquake shaking. Loose to medium dense granular material with no fines or with low plasticity fines are most susceptible to seismic compression. Based on the shallow rock encountered in the subsurface explorations, the potential for seismic compression (dynamic dry settlement) is not considered a hazard at the site.

Lateral spreading is a movement in a nearly horizontal soil zone (usually attributable to liquefaction) that causes the overlying soil mass to shift down a gentle slope or toward a free face such as incised water bodies. Because the site and surrounding areas have generally insignificant topographic relief and no potentially liquefiable soils, the potential for lateral spreading is considered low.

3.4.4 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. Clay soils were not observed at the site; therefore, the potential for expansive soils to affect the project are considered low.

3.4.5 Subsidence

The site is not located in an area of known significant ground subsidence due to the withdrawal of subsurface fluids. Therefore, the potential for subsidence occurring at the site due to the withdrawal of oil, gas, or water is considered low.

3.4.6 Flooding

The Flood Insurance Rate Map prepared by the Federal Emergency Management Agency (FEMA) was reviewed to identify the potential flood hazard for the project. This map indicates the site is within Zone X or D, defined as being an area outside the Special Flood Hazard Area and higher than the elevation of the 0.2-percent-annual-chance flood or being in an area in which flood hazards are undetermined, respectively. Based on this information the potential for the project site to be impacted by regional flooding is considered low. However, the accuracy of this

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information should be confirmed by a qualified civil engineer/hydrologist. The need and/or method for mitigation of potential flooding should also be addressed.

3.4.7 Oil and Gas Fields

The California Division of Oil, Gas & Geothermal Resources (2016) has mapped oil, gas, and geothermal fields in the region. Based on the map, the site is not situated within an area of known abandoned oil wells. No active wells are known to exist within the project boundary. The nearest gas field is the Nicolaus Gas field located approximately 17 miles west of the project site. This site has three wells (DOGGR, 2016).

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4 GEOTECHNICAL DESIGN RECOMMENDATIONS

4.1 GENERAL

Based on the results of our field exploration, it is our professional opinion that the proposed project is geotechnically feasible, provided the recommendations presented in the geotechnical report are incorporated into the project design and construction. We identified the following key geotechnical considerations during our study.

- The proposed Costco warehouse building and fuel facility may be supported on a conventional shallow foundation system. Based on the preliminary grading plan, the warehouse building footprint is situated on a cut/fill transitional area with fills up to approximately 10 feet in the south-western corner of the building and cuts up to about 5 feet in the south-eastern corner. Overexcavation and recompaction of on-site soils/weathered bedrock is recommended to reduce the potential for differential settlement and provide relatively uniform support for the proposed warehouse and other improvements.

- Soils within 10 feet laterally of the warehouse pad (including the entrance canopy, building aprons, utility pads, stairs, ramps, stoops, and the loading dock) should be overexcavated to a depth of at least 2 feet below existing grade, 3 feet below the bottom of the footings, or 3 feet below the bottom of the floor slabs, whichever is deeper. If existing fill soils are encountered at the base of the overexcavation, the overexcavation should continue until the fill is removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill.

- Gravel to cobble-sized rock fragments generated from weathering of the underlying granite bedrock were commonly encountered below approximately 5 feet and may impact excavations for foundations and utilities in the building pads and site. Depth to refusal in the soil borings and test pits ranged between 7 and 20 feet. The seismic refraction survey results (see Appendix C) indicate variability in depth to bedrock across the warehouse and fuel station sites and a general depth of rippability of approximately 12 feet. It should be noted that the depth to less weathered rock is highly variable and difficult excavation, which may require blasting, may be encountered at shallower depths. Further discussion is provided in Section 5.2.5.

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- Rock or other soil fragments greater than 6 inches in size should not be used in fills. Within the upper 3 feet of building pads, rock or other soil fragments greater than 3 inches in size should not be used. Screening of oversized materials will be necessary to reuse the on-site material as structural fill. It is also likely that deeper onsite excavations may generate abundant boulders.

- For pavement, sidewalk, and other flatwork areas (including the fuel facility), soils should be overexcavated to a depth of at least 18 inches below existing grade. Overexcavation is not required in cut areas provided loose/soft shallow soils and organic rich materials are removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The over-excavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.

- Rainfall will infiltrate near surface soils and collect on less permeable soil and rock at shallow depth. Therefore, the contractor will likely encounter shallow perched groundwater in excavations, particularly in the northern half of the site and the northern portion of the fuel facility following rainfall events and in the winter and spring months. During a large portion of our field work, a majority of the entire site was not drivable using trucks and truck mounted equipment due to multiple rainfall events passing through the area. The perched groundwater will likely be present at or near subgrade level across the entire site during and after rainfall events. Temporary and permanent drainage provisions will likely be required for these areas as discussed in Section 5.2.3.

- The site soils contained approximately 25 to 30 fines and are moisture sensitive and susceptible to disturbance, rutting, and pumping during construction. The contractor should plan to repair subgrade conditions that become unstable/disturbed and should develop a plan to manage subgrade trafficability across the site throughout the construction period. Features of this plan may include temporary surface haul roads, limited traffic routes, etc.

- Due to a poor draining subgrade as a result of near surface bedrock, we recommend installing perimeter foundation drains for the warehouse building and radial finger drains below new pavement sections. Additionally, planters should be detailed such that water exiting from them will not seep into the foundation areas or beneath slabs and pavement.

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- The minimum resistivity of the samples tested indicate that the soil may be mildly corrosive towards ferrous metals (NACE, 2006). The concentrations of soluble sulfates indicate that the subsurface soils represent a Class S0 exposure to sulfate attack on concrete in contact with the soil based on ACI 318 Table 4.2.1 (ACI, 2011). Therefore, in accordance with ACI Building Code 318-11, no special provisions for selection of cement type are required.

- We have assessed the potential for storm water infiltration into the subgrade soils at the subject project site based on soil type and laboratory testing. The onsite soils in the upper 10 to 20 feet below the existing ground surface at the site are comprised primarily of clayey and silty sand, with gravel to cobble size rock fragments. Seasonal perched groundwater was observed within these sandy soils above the bedrock. Given the moderate infiltration capacity of the on-site soils and observed perched groundwater, we recommend alternatives to infiltration Best Management Practices (BMPs), such as bio-filtration/bio-retention systems (bio-swales and planter boxes), be implemented at the project site.

The following opinions, conclusions, and recommendations are based on the properties of the materials encountered in the borings and test pits, the results of the laboratory-testing program, and our engineering analyses performed.

4.2 2016 CBC SEISMIC DESIGN PARAMETERS

Based on information obtained from the investigation, published geologic literature and maps, and on our interpretation of the 2016 California Building Code (CBC) criteria, it is our opinion that the project site may be classified as Site Class C, Soft Rock, according to Section 1613.3.2 of 2016 CBC and Table 20.3-1 of ASCE 7-10. Approximate coordinates for the site are noted below.

- Latitude: 38.81011° N
- Longitude: 121.20501° W

The Risk-Targeted Maximum Considered Earthquake (MCE_R) mapped spectral accelerations for 0.2 seconds and 1 second periods (S_s and S_1) were estimated using Section 1613.3 of the 2016 CBC and the U.S. Geological Survey (USGS) web based application (available at http://geohazards.usgs.gov/designmaps/us/application.php). The mapped acceleration values and associated soil amplification factors (F_a and F_v) based on the 2016 CBC and corresponding

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site modified spectral accelerations (S_{MS} and S_{M1}) and design spectral accelerations (S_{DS} and S_{D1}) are presented in Table 2.

According to Section 1803.5.12 of the 2016 CBC, in the absence of a site-specific ground motion hazard analysis, the MCE geometric mean peak ground acceleration adjusted for Site Class effects (PGA_M) can be determined based on Equation 11.8-1 in Section 11.8.3 of ASCE 7-10.

TABLE 2
2016 CBC SEISMIC DESIGN PARAMETERS

Design Parameter	Recommended Value
Site Class	C
S_s (g)	0.477
S_1 (g)	0.242
F_a	1.200
F_v	1.558
S_{MS} (g)	0.572
S_{M1} (g)	0.377
S_{DS} (g)	0.382
S_{D1} (g)	0.252
PGA_M (g)	0.186

4.3 FOUNDATIONS

4.3.1 General

Based on the results of our field exploration, laboratory testing, and geotechnical analyses, the proposed warehouse building and fueling facility may be supported on conventional shallow spread footing foundations founded on subgrade prepared in accordance with Section 5.2.2. Proposed light poles may be supported on short drilled pile foundations. Recommendations for the design and construction of shallow foundations and drilled pile foundations are presented below.

4.3.2 Shallow Foundations

<u>Allowable Soil Bearing Pressure</u>

Footings may be may be designed for a net allowable soil bearing pressure of 3,000 pounds per square foot (psf) for dead plus sustained live loads. Footings should be embedded at least

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18 inches below the lowest adjacent exterior grade. The footing dimension and reinforcement should be designed by the structural engineer; however, continuous and isolated spread footings should have minimum widths of 18 and 24 inches, respectively. A one-third increase in the above bearing pressures can be used for transient wind or seismic loads.

Estimated Settlements

We estimate total static settlement for foundations designed and constructed in accordance with the recommendations presented above to be less than 1 inch. Differential static settlement between similarly loaded footings is estimated to be less than ½ inch over 50 feet.

Lateral Resistance

Lateral load resistance may be derived from passive resistance along the vertical sides of the footings, friction acting at the base of the footing, or a combination of the two. An allowable passive resistance of 250 psf per foot of depth may be used for design. Allowable passive resistance values should not exceed 2,500 psf. An allowable coefficient of friction of 0.35 between the base of the footings and the engineered fill soils can be used for sliding resistance using the dead load normal stresses. Friction and passive resistance may be combined without reduction. We recommend that the first foot of soil cover be neglected in the passive resistance calculations if the ground surface is not protected from erosion or disturbance by a slab, pavement or in a similar manner.

4.3.3 Short Drilled Pile Foundations

Axial Capacity

The compressive axial capacity of drilled piles may be estimated based on an allowable skin friction capacity of 350 pounds per square foot. The upper 1 foot of the skin friction capacity should be ignored. The uplift capacity may be estimated as 70 percent of the allowable compressive axial capacity. A one-third increase in the allowable capacities may be used for transient loading conditions such as wind or seismic loads.

Settlement

Settlement of the proposed canopy supported on drilled piles, as recommended, is estimated to be less than ½ inch.

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Lateral Resistance

The drilled pile foundations lateral resistance can be designed in general accordance with Section 1807.3 of the 2016 CBC. We recommend a lateral soil bearing pressure of 250 psf per foot of depth below grade. The lateral soil bearing pressure should not exceed 2,500 psf. Since drilled piles will act as isolated pole foundations, the allowable lateral soil bearing pressure may be increased by a factor of 2 for short-term lateral loads provided the structure will not be adversely affected by ½ inch of lateral movement at the ground surface.

4.4 BUILDING SLAB-ON-GRADE

Concrete slab-on-grade floors are appropriate for the proposed warehouse, provided subgrade is prepared in accordance with Section 5.2.2. In accordance with the CWDRs, we recommend the slab be a minimum nominal thickness of 6 inches and underlain by at least 6 inches of aggregate base material. Aggregate base materials should meet current Caltrans specifications for Class 2 aggregate base. Please note that Caltrans Class 2 aggregate base may utilize recycled materials. The use of recycled material is typically not allowed under the warehouse building slab and requires Costco's approval.

A modulus of subgrade reaction of 125 pounds per cubic inch may be used for design of slabs underlain 6 inches of compacted aggregate base material. Pursuant to current Costco Wholesale standard construction design practices, we have evaluated the necessity of using a steel-reinforced slab. Based on the geotechnical characteristics of the site, the proposed warehouse can be built with a non-reinforced slab.

Floor slab control joints should be used to reduce damage due to shrinkage cracking. Control joint spacing is a function of slab thickness, aggregate size, slump, and curing conditions. The requirements for concrete slab thickness, joint spacing, and reinforcement should be established by the designer, based on experience, recognized design guidelines and the intended slab use. Placement and curing conditions will have a strong impact on the final concrete slab integrity.

Kleinfelder typically recommends installation of a vapor barrier beneath the slab to mitigate potential moisture issues such as flooring performance and mold. However, we understand that Costco Wholesale has determined that moisture barriers are not to be used in construction of Costco Wholesale warehouses due to adverse effects on concrete curing and performance. Therefore, we have provided construction recommendations that do not include installation of a

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moisture barrier, with the understanding that there will be an increased risk for adverse moisture issues.

4.5 EXTERIOR FLATWORK

Exterior concrete slabs for pedestrian traffic within the Costco development should be underlain by at least a 4-inch layer of crushed aggregate base. Exterior flatwork subject to traffic loading should be designed as pavement. The subgrade should be prepared in accordance with Section 5.2.2.

4.6 SITE DRAINAGE

Foundation and slab performance depends greatly on proper irrigation and how well runoff water drains from the site. This drainage should be maintained both during construction and over the entire life of the project. The ground surface around structures should be graded such that water drains away from structures without ponding. The surface gradient needed to do this depends on the landscaping type. Surface gradients should conform to current Costco Wholesale standards and the 2016 CBC.

Due to poor draining subgrade from shallow bedrock, we recommend installing perimeter foundation drains for the warehouse building and radial finger drains below the new pavement sections. Additionally, planters should be detailed such that water exiting from them will not seep into the foundation areas or beneath slabs and pavement.

Where slabs or pavement areas abut landscaped areas, the aggregate base and subgrade soil should be protected against saturation. Vertical cut off structures are recommended to reduce lateral seepage under slabs from adjacent landscaped areas. Vertical cut-off structures may consist of deepened concrete perimeters, or equivalent, extending at least three inches below the base/subgrade interface. Vertical cut-off structures should be poured neat against undisturbed native soil or compacted fill. The cut-off structures should be continuous.

Operations personnel should be instructed to limit irrigation to the minimum level necessary to properly sustain landscaping plants. Should excessive irrigation, waterline breaks or unusually high rainfall occur, saturated zones and “perched” groundwater may develop, which could soften the subgrade and reduce pavement life and could also create potholes. We also recommend that the downspouts from roof drains be connected to a designed subsurface drainage system such

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as a storm sewer, etc. to avoid discharging water onto pavement areas as well as backfill zones around the warehouse.

Potential sources of water such as water pipes, drains, and the like should be frequently examined for signs of leakage or damage. Any such leakage or damage should be promptly repaired.

Sewer lines beneath the warehouse should have a sufficient slope (at least 1 percent). Plumbing and utility lines should be provided with flexible joints or oversized sleeves where they penetrate floor slabs to prevent breakage caused by differential slab movement. In addition, utility trenches should be plugged with cohesive backfill where they enter the building to reduce moisture infiltration along pipe bedding material. The cohesive backfill materials should have a plasticity index (PI) between 15 and 30 and no less than 70 percent of the particles passing the No. 200 sieve.

4.7 RETAINING STRUCTURES

Design earth pressures for retaining structures depend primarily on the allowable wall movement, wall inclination, type of backfill materials, backfill slopes, surcharges, and drainage. The earth pressures provided assume that on-site granular (sandy) soils will used as backfill within a horizontal distance of at least one-half the height of the wall. The on-site clays should not be used as retaining wall backfill. If a drainage system is not installed, the wall should be designed to resist hydrostatic pressure in addition to the earth pressure. Determination of whether the active or at-rest condition is appropriate for design will depend on the flexibility of the walls. Walls that are free to rotate at least 0.002 radians (deflection at the top of the wall of at least 0.002 x H, where H is the unbalanced wall height) may be designed for the active condition. Walls that are not capable of this movement should be assumed rigid and designed for the at-rest condition. The recommended active and at-rest earth pressures and passive resistance values are provided in Table 3.

TABLE 3
LATERAL EARTH PRESSURES FOR RETAINING STRUCTURES
(ON-SITE GRANULAR BACKFILL)

Wall Movement	Backfill Condition	Equivalent Fluid Pressure (pcf)
Free to Deflect (active condition)	Level	40
Restrained (at-rest condition)		60
Passive		250

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Walls supporting more than 6 feet of backfill should be designed to support an incremental seismic lateral pressure of 8 pcf, applied as a regular triangle distribution (not inverted). The seismic lateral earth pressure was calculated using a pseudo-static acceleration corresponding to one-half of the Design Earthquake PGA, which is two-thirds of the PGA_M. When designing for seismic loads for restrained walls, the seismic lateral earth pressure should be combined with the active earth pressure. If designing for static loading only for restrained walls, the at-rest lateral earth pressure should be used.

The above lateral earth pressures do not include the effects of surcharges (e.g., traffic, footings), compaction, or truck-induced wall pressures. Any surcharge (live, including traffic, or dead load) located within a 1:1 (horizontal to vertical) plane drawn upward from the base of the excavation should be added to the lateral earth pressures. The lateral contribution of a uniform surcharge load located immediately behind walls may be calculated by multiplying the surcharge by 0.33 for cantilevered walls under active conditions and 0.50 for restrained walls under at-rest conditions. Walls adjacent to areas subject to vehicular traffic should be designed for a 2-foot equivalent soil surcharge (250 psf). Lateral load contributions from other surcharges located behind walls may be provided once the load configurations and layouts are known.

Walls should be properly drained or designed to resist hydrostatic pressures. Adequate drainage is essential to provide a free-drained backfill condition so that there is no hydrostatic buildup behind the wall. Walls should also be appropriately waterproofed to reduce the potential for staining. Drainage behind loading dock walls can consist of weep holes placed along the base of the wall. Weep holes should be spaced 10 to 15 feet apart and connected with a gravel drain consisting of approximately 3 cubic feet of clean gravel per foot of wall length wrapped with filter fabric. Other types of retaining walls should have a continuous back drain as described below.

Except for the upper 2 feet, the backfill immediately behind retaining walls (minimum horizontal distance of 2 feet measured perpendicular to the wall) should consist of free-draining ¾-inch crushed rock wrapped with filter fabric. The upper 2 feet of cover backfill should consist of relatively impervious material. A 4-inch-diameter perforated PVC pipe, placed perforations down at the bottom of the rock layer leading to a suitable gravity outlet, should be installed at the base of the walls.

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As an alternative to the gravel drain noted above, a manufactured drain panel may be utilized behind retaining walls in addition to normal waterproofing. This system generally consists of a prefabricated drain panel lined with filter fabric. At the wall base, we recommend that a gravel drain be installed to collect and discharge drainage to a suitable outlet. The drain should consist of a 4-inch-diameter perforated PVC pipe, perforations placed down at the bottom of approximately 3 cubic feet of clean gravel per foot of wall length. The gravel drain should be wrapped in filter fabric (Mirafi 140N or equivalent). The pipe should be sloped to drain to a suitable outlet and cleanouts should be provided at appropriate intervals. If drainage behind the wall is omitted, the wall should be designed for full hydrostatic pressure. The design of any drain panel system should be submitted to Kleinfelder for review to check that our recommendations have been properly incorporated into the design. Installation of the drainage system should be reviewed and documented by a Kleinfelder representative.

4.8 PAVEMENT SECTIONS

The required pavement structural sections will depend on the expected wheel loads, volume of traffic, and subgrade soils. We have provided asphalt concrete and portland cement concrete (PCC) pavement sections for traffic indices provided in the CWDRs (Costco, 2016).

Positive drainage of the paved areas should be provided since moisture infiltration into the subgrade may decrease the life of pavements. Curbing located adjacent to paved areas should be founded in the subgrade, not the aggregate base, in order to provide a cutoff, which reduces water infiltration into the base course.

The following pavement sections provided below are based on the soil conditions encountered during our field exploration, our assumptions regarding final site grades, and limited laboratory testing.

4.8.1 Costco Pavement Design Parameters

We developed pavement design recommendations using traffic loading parameters provided in the Costco Wholesale Development Requirements and the following test data:

- A 20-year pavement design life;
- Light-duty pavements subject to 6,600 passenger vehicle trips per day (Traffic Index of 5.0);
- Heavy-duty pavements subject to 30 tractor-trailer truck tips per day (Traffic Index of 7.0);

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- For asphalt concrete pavements, a design R-value of 20; and
- For portland cement concrete (PCC) Pavements, a 28-day flexural strength (modulus of rupture determined by the third-point method) of at least 550 pounds per square inch (psi) (approximate compressive strength of 4,000 psi); a modulus of subgrade reaction (k value) of 100 pounds per cubic inch (pci) for native subgrade; and interlock at the control joints.

4.8.2 Asphalt Concrete Pavement

We designed asphalt concrete pavement, also referred to as Hot Mix Asphalt (HMA), in accordance with the Asphalt Institute Manual Series (MS-1), Asphalt Pavements for Highways and Streets. Alternatively, asphalt concrete pavement sections were also designed using the Caltrans Highway Design Manual for comparison. HMA should conform to requirements of the Costco Wholesale Specification Section 321216, Asphalt Paving. Pavement lifts should not exceed three inches. Table 4 presents recommended minimum HMA pavement sections. The designer should select the appropriate pavement sections based on projects requirements. Prior to placement of aggregate base, pavement subgrade should be prepared in accordance with Section 5.2.2.

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TABLE 4
RECOMMENDED MINIMUM ASPHALT CONCRETE PAVEMENT SECTIONS

Traffic Use	Traffic Index, TI	Design Method	Asphalt Concrete* (inches)	Aggregate Base* (inches)
Light-Duty Pavement	5.0	MS-1	4.0	6.0
		Caltrans	3.5	6.0
Heavy-Duty Pavement	7.0	MS-1	5.0	12.0
		Caltrans	5.0	10.0

* Rounded to the closest ½ inch.

4.8.3 Asphalt Performance Grade Binder

Performance Grade (PG) Binder 70-10 may be used for the project. This recommendation was developed in accordance with Costco Wholesale Specifications Section 321216. This binder is commonly used throughout Northern California. Air temperature data nearest the project site was used with the MERRA Climate Data option and the PG was selected using the FHWA program LTTPBind Online web-based tool based on the AASHTO M323-13 standard. The high-end and low-end temperature ratings were selected to provide a reliability of at least 98 and 90 percent, respectively.

4.8.4 Portland Cement Concrete Pavement

We designed PCC pavement in accordance with the Portland Cement Association (PCA) Thickness Design for Concrete Pavements (PCA, 1984). The design assumes that the PCC will have a 28-day flexural strength (modulus of rupture determined by the third-point method) of at least 550 pounds per square inch (psi) (approximate compressive strength of 4,000 psi). A design modulus of subgrade reaction (k value) of 125 pounds per cubic inch (pci) was assumed for the top of the compacted aggregate base. It was also assumed that aggregate interlock would be developed at the control joints. The pavement sections are based on a theoretical design life of 20 years.

Recommended minimum PCC sections are presented in Table 5. Prior to placement of aggregate base, pavement subgrade should be prepared in accordance with Section 5.2.2.

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TABLE 5
RECOMMENDED MINIMUM PCC PAVEMENT SECTIONS

Traffic Use	Traffic Index, TI	PCC * (inches)	Aggregate Base* (inches)
Light-Duty Pavement	5.0	6.5	6.0
Heavy-Duty Pavement	7.0	7.0	6.0

* Rounded to the closest ½ inch.

4.8.5 Aggregate Base

Aggregate base materials should meet current Caltrans specifications for Class 2 aggregate base. Please note that Caltrans Class 2 aggregate base may utilize recycled materials. The use of recycled material requires Costco's approval.

4.8.6 Pavement Maintenance

Pavements may undergo movement due to changes in subgrade moisture content. This movement tends to accelerate pavement deterioration. A crack sealing program should be performed annually to slow pavement deterioration. Any areas where surface water stands on the surface should be remediated. Over time as cracking becomes more pronounced, a slurry seal coat should be applied

4.9 SOIL CORROSIVITY

We performed laboratory testing for parameters commonly used to evaluate corrosivity of soils, including pH, minimum resistivity, oxidation reduction potential, redox, chloride and soluble sulfate content. Table 6 presents the results.

TABLE 6
CORROSION TEST RESULTS

Location	Depth (ft)	Minimum Resistivity, (ohm-cm)		pH	Oxidation Reduction Potential, mV	Water-Soluble Ion Concentration ^, ppm		
		Saturated	In-Situ Moisture			Chloride	Sulfide	Sulfate
TP-4	0-2	No Test	No Test	5.71	377	No Test	Not Present	No Test
TP-5	0-1	No Test	No Test	5.61	331	No Test	Not Present	No Test
B-5	3-4	13,400	No Test	5.16	323	6.5	Not Present	2.2
B-17	3-4	20,640	No Test	5.35	309	6.1	Not Present	1.5

Note: ^ Water soluble ion concentrations are reported as % in soil by mass.

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These tests are a generalized indicator of soil corrosivity for the sample tested. Other soils on site may be more, less, or similarly corrosive in nature. Imported fill materials should be tested to confirm that their corrosion potential is not more severe than those noted.

Although Kleinfelder does not practice corrosion engineering, resistivity values greater than 10,000 ohm-cm are normally considered mildly corrosive to buried ferrous metals (NACE, 2006). The concentrations of soluble sulfates indicate that the subsurface soils represent a Class S0 exposure to sulfate attack on concrete in contact with the soil based on ACI 318 Table 4.2.1 (ACI, 2011). Therefore, in accordance with ACI Building Code 318-11, no special provisions for selection of cement type are required.

We understand gasoline station equipment is constructed of corrosion resistant synthetic materials. We recommend the gasoline station designer review these results and consult a corrosion expert for further evaluation, if necessary.

4.10 STORM WATER MANAGEMENT

We have assessed the potential for storm water infiltration into the subgrade soils at the subject project site based on soil type and laboratory testing. Pursuant to the current standard of practice, an infiltration evaluation is a two-step process. The first step is to characterize the site to assess whether infiltration is feasible. If infiltration is feasible, then infiltration testing is needed to provide a design infiltration rate (step two).

Based on visual soil classification and laboratory testing of the soil samples collected during our field exploration, the onsite soils in the upper 10 to 20 feet below the existing ground surface at the site are comprised primarily of silty and clayey sand with gravel to cobble sized rock fragments. Seasonal perched groundwater was also observed within these sandy soils above the bedrock. Given the moderate infiltration capacity of the on-site soils and observed perched groundwater, we recommend alternatives to infiltration Best Management Practices (BMPs), such as bio filtration/bio-retention systems (bio-swales and planter boxes), be implemented at the project site.

If bio-filtration/bio-retention systems are employed, we recommend that the BMPs be built such that water exiting from them will not seep into the foundation areas or beneath slabs and pavement. If planters are located within 10 feet of the structures, or adjacent to slabs and pavements, then some means of diverting water away from the building, building foundation soils, or soils that support slabs and pavements would be required, such as lining the planters.

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5 CONSTRUCTION RECOMMENDATIONS

5.1 GENERAL

The following recommendations should be used by the contractor for construction of the project, attention to excavatability and perched groundwater should be noted.

5.2 EARTHWORK

5.2.1 General

Site preparation and earthwork operations should be performed in accordance with applicable codes, safety regulations and other local, state or federal specifications, and the recommendations included in this report. References to maximum dry unit weights are established in accordance with the latest version of ASTM Test Method D1557 (Modified Proctor). The earthwork operations should be observed and tested by a representative of Kleinfelder.

5.2.2 Site Preparation

Abandoned utilities and other existing features within the proposed development areas (if any are encountered) should be removed and the excavation(s) backfilled with engineered fill. Debris produced by demolition operations, including wood, steel, piping, plastics, etc., should be separated and disposed of off-site. Existing utility pipelines or conduits that extend beyond the limits of the proposed construction and are to be abandoned in place, should be plugged with non-shrinking cement grout to prevent migration of soil and/or water. Demolition, disposal and grading operations should be observed and tested by a representative of Kleinfelder.

Prior to grading and subgrade preparation, all vegetation should be cut and removed from the site. Roots and vegetative matter in excess of one inch should be removed by screening or raking soils to a minimum depth of 12 inches. Additional stripping is not anticipated.

Based on the preliminary grading plan, the warehouse building footprint is be situated on a cut/fill transition with fills up to approximately 10 feet in the south-western corner of the building and cuts up to about 5 feet in the south-eastern corner. Overexcavation and recompaction of on-site soils/weathered bedrock is recommended to reduce the potential for differential settlement and provide relatively uniform support for the proposed warehouse and other improvements.

Soils within 10 feet of the warehouse pad (including the entrance canopy, building aprons, utility pads, stairs, ramps, stoops, and the loading dock) should be overexcavated to a depth of at least

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2 feet below existing grade, 3 feet below the bottom of the footings, or 3 feet below the bottom of the floor slabs, whichever is deeper. If existing fill soils are encountered at the base of the overexcavation, the overexcavation should continue until the fill is removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill.

Gravel to cobble-sized rock fragments generated from weathering of the underlying granite bedrock were commonly encountered below approximately 5 feet below the existing grade and may significantly impact excavations for foundations and utilities in the building pad and fuel center site. Rock or other soil fragments greater than 6 inches in size should not be used in fills. Within the upper 3 feet of building pads, rock or other soil fragments greater than 3 inches in size should not be used. Screening of oversized materials will be necessary to reuse the on-site material as structural fill.

For pavement, sidewalk, and other flatwork areas (including the fuel facility), soils should be overexcavated to a depth of at least 18 inches below existing grade. Overexcavation is not required in cut areas provided loose/soft shallow soils and organic rich materials are removed. The overexcavated soils can be moisture conditioned and recompacted as structural fill. The over-excavation should extend beyond the proposed improvements a horizontal distance of at least 2 feet.

Following overexcavation and prior to replacing soils with compacted fill, the exposed subgrade should be proof-rolled with a fully-loaded tandem-axle dump truck or water truck. Areas identified as being soft or yielding may require additional compaction or over-excavation as determined by a representative of the geotechnical engineer.

The site soils contained approximately 25 to 30 fines and are moisture sensitive and susceptible to disturbance, rutting, and pumping during construction. The contractor should plan to repair subgrade conditions that become unstable/disturbed and should develop a plan to manage subgrade trafficability across the site throughout the construction period. Features of this plan may include temporary surface haul roads, limited traffic routes, etc.

5.2.3 Groundwater Impacts

Rainfall will infiltrate near surface soils and collect on less permeable soil and rock at shallow depth. Perched groundwater above the bedrock was encountered in the soil borings and test pits that were advanced following a period of heavy rainfall and may be encountered during

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construction. This is most likely to occur following periods of rainfall and in the winter and spring months. If encountered, excavations which extend below the perched groundwater level (currently estimated to be at approximately 1 to 10 feet below existing site grade) will need to be dewatered. In our opinion, dewatering of narrow trench excavations, which penetrate less than a few feet below the groundwater level and do not encounter loose and/or cohesionless soils, may be possible by directing inflow to a sump where water can be removed by a pump. Temporary dewatering of wider, deeper, and/or more extensive excavations may require well points, deep wells, and/or deep sumps. To help maintain bottom stability of wider, deeper, and/or more extensive excavations, groundwater levels should be drawn-down a minimum of 2 feet below the lowest portion of the excavation. Since temporary dewatering will impact and be dependent on construction methods and scheduling, we recommend the Contractor be solely responsible for the design, installation, maintenance, and performance of all temporary dewatering systems.

Perched groundwater levels can fluctuate depending on rainfall, runoff conditions, or other factors. Therefore, water levels presented in this report may not be representative of those encountered at the time of construction. We recommend the Contractor verify perched groundwater conditions and evaluate dewatering requirements prior to bidding and/or construction.

Depending on the depth of excavation below perched groundwater, soil conditions encountered along the excavation face, and slope inclination, caving or sloughing of excavation slopes is likely within the vicinity of a sump dewatering system. Sloughing or caving of excavation slopes could endanger personnel working within or adjacent to the excavation as well as nearby equipment, structures, or other existing improvements. The Contractor should be aware of the potential for caving and take appropriate precautions to insure the safety of site personnel as well as the integrity of the excavation slopes and any existing, nearby structures or other improvements.

5.2.4 Foundation Excavations

Shallow Foundations

Following excavation to the foundation subgrade elevations, the exposed subgrade should be observed by a representative of the geotechnical engineer to evaluate the presence of satisfactory materials at design elevations. If unsatisfactory material, such as soft or disturbed soil, debris or otherwise unsuitable soil is present at the base of footing excavations, it should be overexcavated and replaced with structural concrete, 2-sack sand-cement slurry, or structural fill to the depth determined by the geotechnical engineer.

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Drilled Pile Foundations

The performance and capacities of piles can be influenced significantly by the selected construction methods and procedures used. Construction methods that create large zones of disturbance around the drilled shafts can lead to lower than expected skin friction due to excessive stress relief around the shaft length. Drilling of the pile shafts should be accomplished using heavy-duty excavation equipment maintained in good condition. It should be noted that gravel- to cobble-sized rock fragments and granite bedrock were encountered in the test pits and borings below a depth of about 5 feet below existing grades and difficult excavation conditions may be encountered. In addition, practical auger refusal on bedrock was encountered at depths as shallow as approximately 7 feet below grade in the borings. The foundation drilling contractor should select equipment and tooling that is capable of reaching the planned foundation depths in such material, especially in cut areas.

Concrete should be placed immediately after drilling of the hole is complete. The concrete should be pumped to the bottom of the drilled shaft using a down-hole tremie.

5.2.5 Fill Material and Compaction Criteria

The on-site soils, minus debris, organic matter, or other deleterious materials, may be used as general engineered fill. Rock or other soil fragments greater than 6 inches in size should not be used in fills. Within the upper 3 feet of building pads, rock or other soil fragments greater than 3 inches in size should not be used. Screening of oversized materials will be necessary to reuse the on-site material as structural fill.

Import soils should have no particles greater than 3 inches in maximum dimension, no less than 70 percent of the particles passing the No. 4 sieve, no more than 25 percent of particles passing the No. 200 sieve, and a Plasticity Index (PI) less than 5. The contractor should provide documentation that all imported soil is free of hazardous materials, including petroleum or petroleum byproducts, chemicals and harmful minerals. Test results with the geotechnical and analytical properties of the proposed import material should be provided to Costco for approval prior to transportation and use on site.

Fill soils should be compacted to at least 95 percent of the maximum dry unit weight (ASTM D1557) in accordance with the Costco Wholesale Development Requirements (CWDRs). Fill soils should be compacted to moisture contents between -2 and +1 percent of the optimum moisture content during compaction. If both compaction and moisture content criteria are not

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within the specified tolerances, the fill should not be accepted, and the contractor should rework the material until the fill is placed within the specified tolerances.

Processing may require ripping the material, disking to break up clumps, and blending to attain uniform moisture contents necessary for compaction. Utility trench backfill should be mechanically compacted. Flooding should not be permitted. Table 7 presents structural fill placement and compaction criteria.

TABLE 7
STRUCTURAL FILL PLACEMENT AND COMPACTION CRITERIA

Fill Location/Use	Material Type	Relative Compaction[1] (ASTM D1557)	Moisture Content Range	Minimum Compaction Testing Frequency Per Lift
Aggregate base for pavements and concrete slabs	Aggregate Base	At least 95 percent	-2 to +2% of optimum	10,000 Square Feet
Structural Areas (Warehouse Building Pad and Fuel Facility Canopy)	On-site Soils or Imported Material	At least 95 percent	-2 to +1% of optimum	10,000 Square Feet
Subgrade for Pavements, Sidewalks and Other Flatwork Areas	On-site Soils or Imported Material	At least 95 percent	-2 to +1% of optimum	15,000 Square Feet
Retaining Wall backfill	Imported Material	At least 92 percent	-2 to +1% of optimum	1,000 Square Feet
Utility trenches backfill	On-site Soils or Imported Material	At least 95 percent	-2 to +1% of optimum	150 Linear Feet
Lawns or Unimproved areas	On-site Soils or Imported Material	At least 90 percent	At least optimum	20,000 Square Feet

Note: [1] Where two or more compaction specifications coincide, the more stringent specification should be utilized.

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5.2.6 Excavation and Rippability

Thirty eight (38) borings drilled as part of our field exploration were advanced using hollow-stem-auger drilling equipment. Drilling effort was hard in the soils with significant gravel and cobble sized rock fragments and refusal on granitic bedrock was encountered in 18 of the borings. Ten (10) test pits were excavated to depths of about 8 to 15 feet using a John Deere 160 backhoe equipped with a 24-inch wide bucket. Bedrock was encountered in all of the test pits and refusal was encountered in five of the test pits. Bedrock encountered across the site includes variably fractured and weathered granite. The results of the seismic refraction survey (see Appendix C) indicate variability in depth to bedrock across the warehouse and fuel facility areas and a general depth of rippability of approximately 12 feet. The majority of the shallow rock is anticipated to be highly weathered and rippable to marginally rippable but will likely contain areas of less weathered rock that will be very hard and difficult to excavate. Hammering, pre-drilling and hammering, or similar procedures are anticipated to be required in such hard zones of the rock where excavation equipment meets with refusal. Blasting may be an option. It has been our experience that mechanical removal by hammering may be difficult in some cases and require pre-drilling to help break up the rock where blasting is not feasible. Rock trenchers (rock saws and belted trenchers) or large excavators equipped with rock buckets have generally been able to excavate within the highly weathered rock units but will likely not be able to remove very hard and less weathered zones of rock. Rock trenchers have the added advantage of pulverizing the soil and rock units such that they are generally suitable for trench backfill. This generally eliminates the need to screen out or crush rock fragments for use as trench backfill. It is also likely that deeper onsite excavations may generate abundant boulders. The contractor should consider the difficult excavation conditions to be encountered across a majority of the site when selecting construction equipment.

5.2.7 Temporary Excavations

For planning purposes, we estimate that temporary slopes up to 10 feet in height may be sloped back at an inclination of about 1.5:1 (horizontal to vertical). Sloughing and/or raveling of sandy slopes should be anticipated as they dry out. Where space for sloped embankments is not available, shoring will be necessary. Actual sloping requirements should be determined by contractor's competent person. A contingency should be considered in the event that flatter slopes and/or shoring are required.

If signs of slope instability are observed, the inclination recommended above should be decreased until stability of the slope is obtained. In addition, at the first signs of slope instability, the

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geotechnical engineer should be contacted. Where space for sloped embankments is not available, shoring will be necessary. We recommend the design team and contractor consult with Kleinfelder during the bid development stage. The amount of room available for sloping excavations may dictate whether shoring should be included. Excavations within a 1:1 plane extending downward from a horizontal distance of 2 feet beyond the bottom outer edge of existing improvements should not be attempted without bracing and/or underpinning the improvements. Personnel from the geotechnical engineer should observe the excavations so that modifications can be made to the excavations, as necessary, based on variations in the encountered soil conditions. All applicable excavation safety requirements and regulations, including OSHA requirements, should be met.

Where sloped excavations are used, tops of the slopes should be barricaded so that vehicles and storage loads do not encroach within a distance equal to the depth of the excavation. Greater setback may be necessary when considering heavy vehicles, such as concrete trucks and cranes. The geotechnical engineer should be advised of such heavy vehicle loadings so that specific setback requirements can be established. If temporary construction slopes are to be maintained during the rainy season, berms are recommended along the tops of the slopes to reduce runoff that may enter the excavation and erode the slope faces.

All trench excavations should be braced and shored in accordance with good construction practice and all applicable safety ordinances and codes. The contractor should be responsible for the structural design and safety of the temporary shoring system, and we recommend that this design be submitted to Kleinfelder for review to check that our recommendations have been incorporated. For planning purposes, the upper on-site soils may be considered a Type C soil, as defined using the current OSHA soil classification.

5.2.8 Oversize Material

Cobble-sized rock fragments were observed during our field investigation and may significantly impact excavations for foundations and utilities in the warehouse pad, fuel facility, and site. Larger rock fragments may also be encountered. The contractor should consider the oversize material to be encountered across a majority of the site when selecting construction equipment. Screening of oversized materials will be necessary to reuse the on-site material as structural fill.

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5.2.9 Trench Backfill

Pipe zone backfill (i.e. material beneath and in the immediate vicinity of the pipe) should consist of imported or on-site sandy soil less than ¾-inch in maximum dimension. Trench zone backfill (i.e., material placed between the pipe zone backfill and finished subgrade) may consist of onsite soil or imported fill that meets the requirements for engineered fill provided above. Due to the coarse particles present in onsite fill material, we recommend that the pipe zone material extend a minimum of 1 foot above the top of the conduit. This will protect the conduit from point loads from individual large particles.

If imported or on-site material is used for trench zone backfill, we recommend it consist of silty sand. In general, gravel should not be used for trench zone backfill due to the potential for soil migration into the relatively large void spaces present in this type of material and water seepage along trenches backfilled with coarse-grained sand and/or gravel.

Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local building requirements and/or bedding requirements for specific types of pipes. We recommend the project civil engineer develop these material specifications based on planned pipe types, bedding conditions, and other factors beyond the scope of this study.

Trench backfill should be placed and compacted in accordance with recommendations provided for structural fill in Section 5.2.4. Mechanical compaction is recommended; ponding or jetting should not be performed, especially in areas supporting structural loads or beneath concrete slabs supported on grade, pavements, or other improvements.

5.3 UNSTABLE SUBGRADE CONDITIONS

Should grading be performed during or following extended periods of rainfall, the moisture content of the near-surface soils will also be significantly above the optimum moisture content. Additionally, some low lying areas of the site may become ponded with water and stream flow. These conditions could seriously impede grading by causing an unstable subgrade condition. Typical remedial measures include the following:

- Drying: Drying unstable subgrade involves disking or ripping wet subgrade to a depth of approximately 18 to 24 inches and allowing the exposed soil to dry. Multiple passes of the equipment (likely on a daily basis) will be needed because as the surface of the soil dries,

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a crust forms that reduces further evaporation. Frequent disking will help prevent the formation of a crust and will promote drying. This process could take several days to several weeks depending on the material, the depth of ripping, the number of passes, and the weather.

- Removal and Replacement with Crushed Rock and Geotextile Fabric: Unstable subgrade could be overexcavated 12 to 24 inches below existing grade and replaced with ¾- or 1-inch crushed rock underlain by geotextile fabric. The geotextile fabric should consist of a woven geotextile, such as Mirafi 600X or equivalent. The final depth of removal will depend upon the conditions observed in the field once overexcavation begins. The geotextile fabric should be placed in accordance with the manufacturer's recommendations.
- Cement Treatment: Unstable subgrade could be stabilized by mixing the upper 12 to 18 inches of the subgrade with portland cement. For estimating purposes, an application rate of 4 to 6 percent may be used. Final application rates should be determined in the field at the time of construction in consultation with the geotechnical engineer. Cement treatment should be performed by a specialty contractor experienced in this work and should be performed in accordance with Caltrans Standard Specifications. Since cement treatment uses the on-site soil, the expense of importing material can be avoided.

5.4 EXTERIOR FLATWORK

Prior to casting exterior flatwork, the subgrade soils should be prepared, as recommended in Section 5.2.2. The moisture content of the subgrade soils should be maintained around optimum for sandy subgrade soils prior to the placement of any flatwork or fill. Careful control of the water/cement ratio should be performed to avoid shrinkage cracking due to excess water or poor concrete finishing or curing.

5.5 PAVEMENTS

The pavement sections provided above are contingent on the following recommendations being implemented during construction.

- Pavement subgrade should be prepared as recommended in Section 5.2.2.
- Subgrade soils should be in a stable, non-pumping condition at the time the aggregate base materials are placed and compacted.

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- Aggregate base materials should be compacted to at least 95 percent relative compaction (ASTM D1557).
- Asphalt paving materials and placement methods should meet current Costco Wholesale Specifications Section 321216.
- Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet.

Note that pavement materials and construction must be completed in strict accordance with the Costco's specifications that contain very specific pavement material (asphalt, aggregate and concrete) criteria and construction practices to be used (compaction and material sampling). The general contractor and pavement construction subcontractor should be aware that asphalt and concrete mix designs must be submitted to the design architect and Kleinfelder at least 45 days prior to the scheduled production and laydown for review and approval.

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6 ADDITIONAL SERVICES

6.1 PLANS AND SPECIFICATIONS REVIEW

We recommend Kleinfelder perform a review of geotechnical related portions of the project plans and specifications before they are finalized to see that geotechnical recommendations have been properly interpreted and implemented during design. If we are not accorded the privilege of performing this review, we can assume no responsibility for misinterpretation of our recommendations.

6.2 CONSTRUCTION OBSERVATION AND TESTING

The construction process is an integral design component with respect to the geotechnical aspects of a project. Because geotechnical engineering is an inexact science due to the variability of natural processes, and because we sample only a limited portion of the soils affecting the performance of the proposed structure, unanticipated or changed conditions can be encountered during grading. Proper geotechnical observation and testing during construction are imperative to allow the geotechnical engineer the opportunity to verify assumptions made during the design process. Therefore, we recommend that Kleinfelder be retained during the construction of the proposed improvements to observe compliance with the design concepts and geotechnical recommendations, and to allow design changes in the event that subsurface conditions or methods of construction differ from those assumed while completing this study.

Our services are typically needed at the following stages of grading:

- After demolition and grubbing;
- During grading;
- After the overexcavation, but prior to subgrade preparation;
- During utility trench backfill;
- During base placement and site paving; and
- After excavation for foundations.

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7 LIMITATIONS

This geotechnical study has been prepared for the exclusive use of Costco Wholesale and their agents for specific application to the proposed Costco Wholesale Warehouse (CW# 16-0132) located southeast of the intersection of Sierra College Boulevard and Brace Road in Loomis, California. The findings, conclusions and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No other warranty, express or implied, is made.

The scope of services was limited to a background data review and the field exploration described in Section 1.2. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions of this assessment are based on our field exploration and laboratory testing programs, and engineering analyses.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service, which provide information for their purposes at acceptable levels of risk. The client and key members of the design team should discuss the issues covered in this report with Kleinfelder, so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, limited laboratory tests, and our present knowledge of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may reevaluate the recommendations of this report. If the scope of the proposed construction, including the estimated Traffic Index or locations of the improvements, changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed, and the conclusions of this report are modified or approved in writing, by Kleinfelder.

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The scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

Kleinfelder cannot be responsible for interpretation by others of this report or the conditions encountered in the field. Kleinfelder must be retained so that all geotechnical aspects of construction will be monitored on a full-time basis by a representative from Kleinfelder, including site preparation, preparation of foundations, and placement of engineered fill and trench backfill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Kleinfelder must also be retained to perform a supplemental e valuation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Because of the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder's geotechnical engineer can be contacted to confirm those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions (both on site and off site) or other factors may change over time, and additional work may be required with the passage of time. Any party, other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of this report and the nature of the new project, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party

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and the client agrees to defend, indemnify, and hold harmless Kleinfelder from any claims or liability associated with such unauthorized use or non-compliance.

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8 REFERENCES

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Figures

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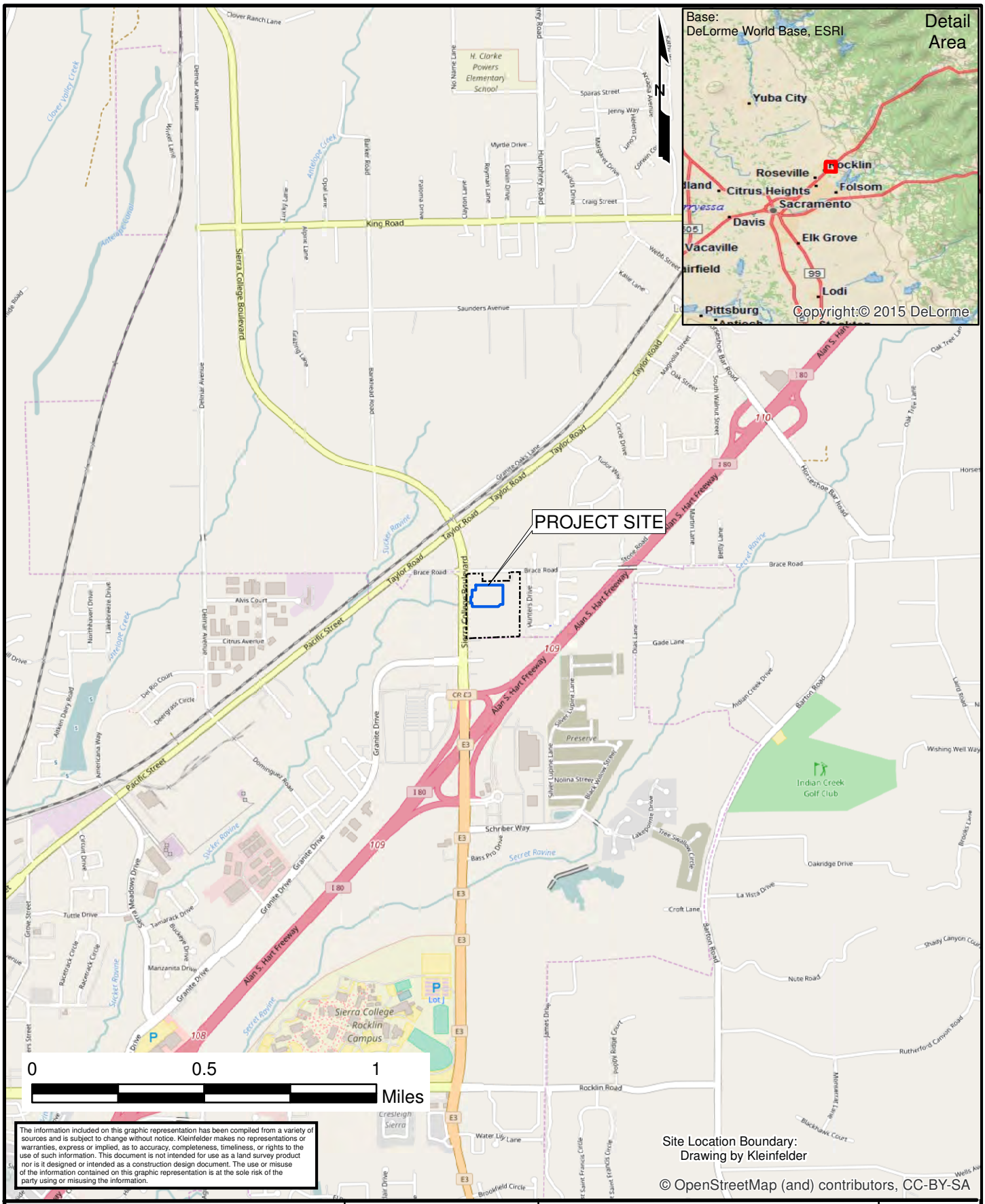

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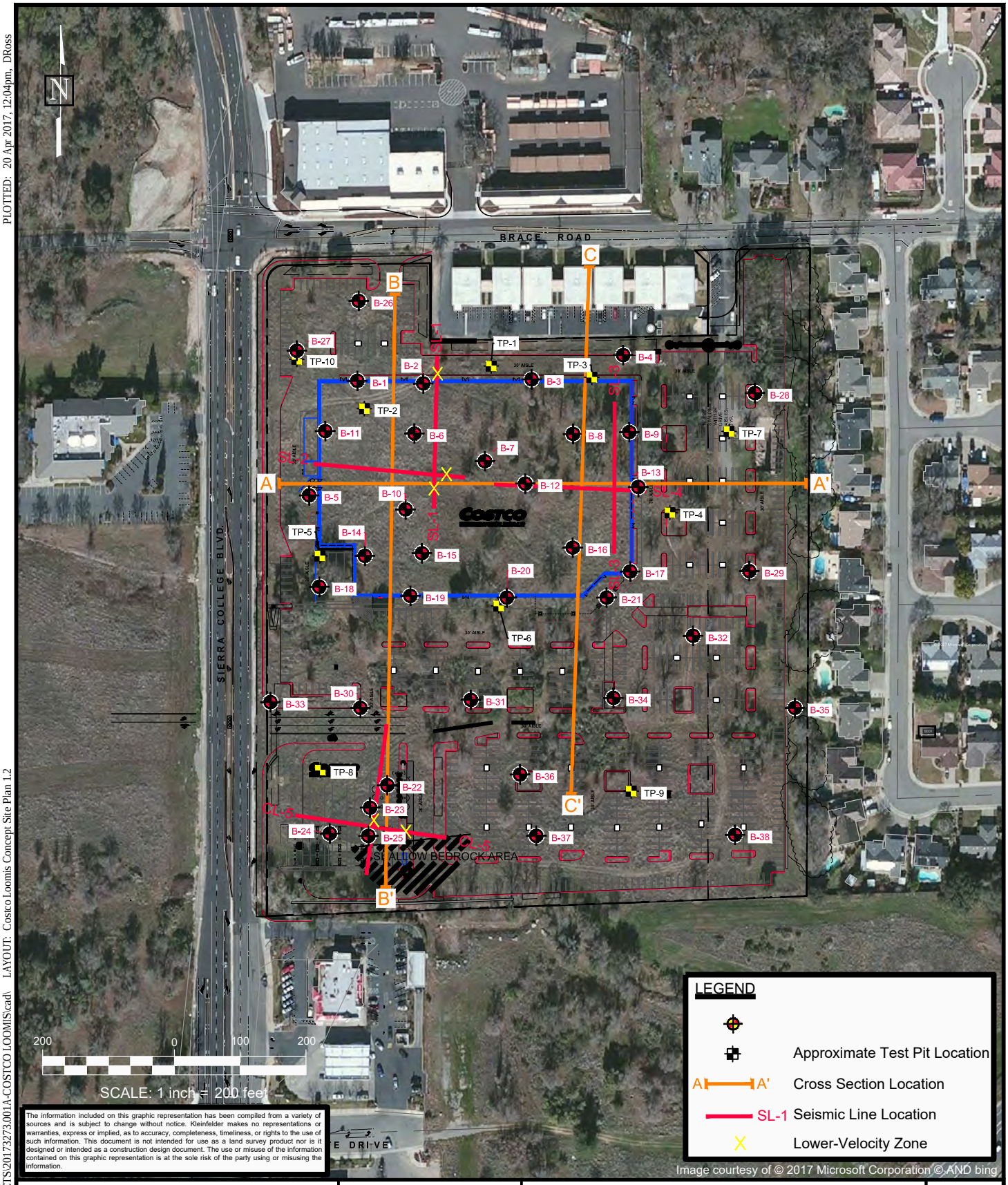
SITE LOCATION MAP

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

1



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EXPLORATION LOCATION MAP

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

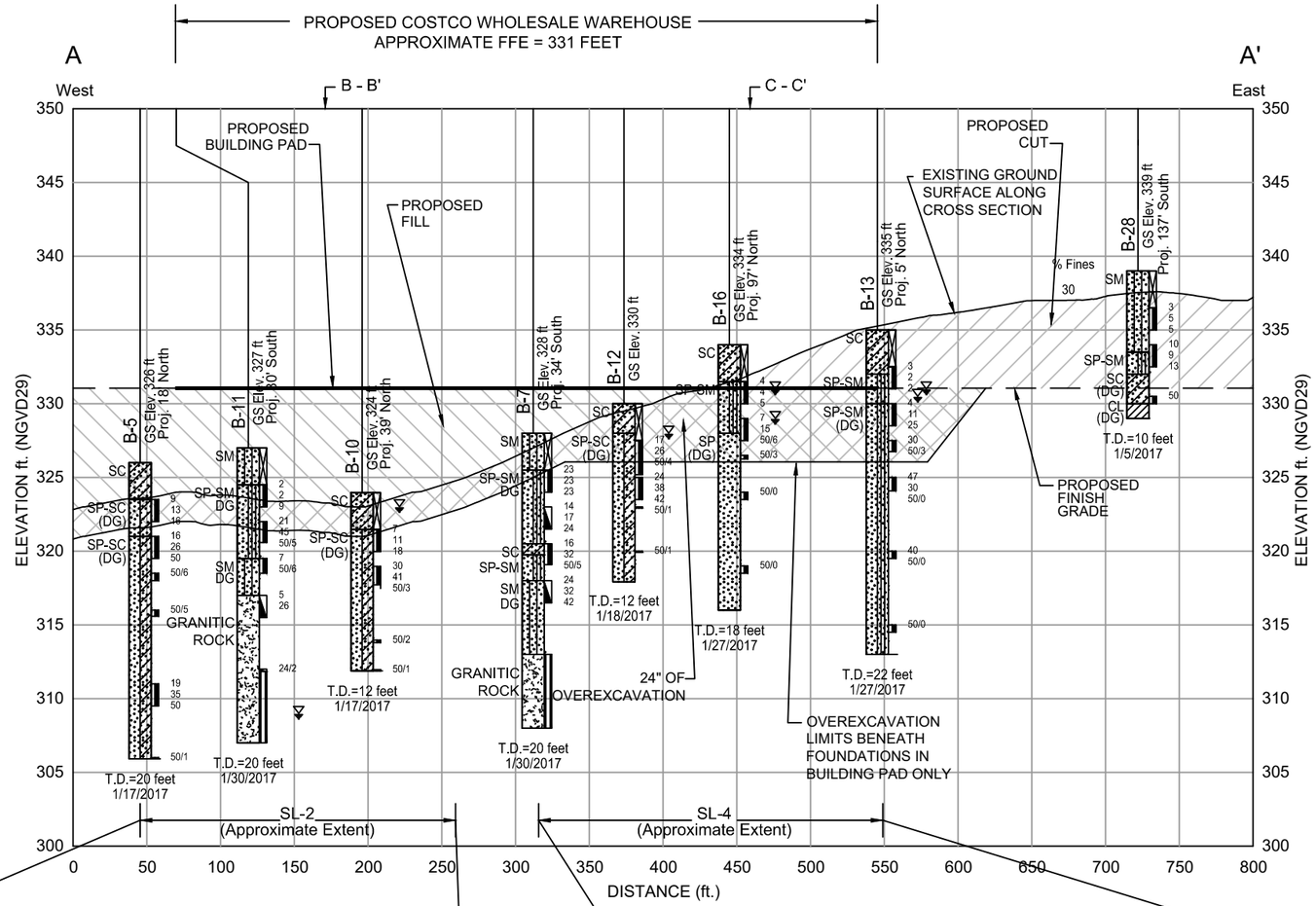
2

PLOTTED: 20 Apr 2017, 12:04pm, DRoss

LAYOUT: Costco Loomis Concept Site Plan 1.2

CAD FILE: K:\2017_PROJECTS\20173273.001A-COSTCO LOOMIS\cad\

PLOTTED: 24 Mar 2017, 6:34am, DRoss



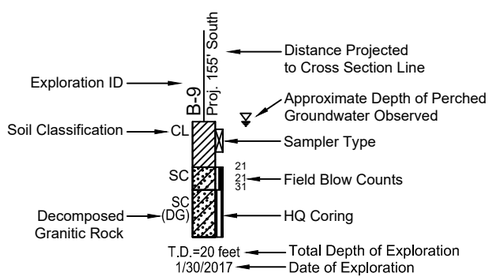
Notes:

1. Spread footings shall be overexcavated to a depth of at least 2 feet below existing grade, 3 feet below the bottom of the footings , or 3 feet below the bottom of the floor slabs, whichever is deeper.
2. Warehouse building slab shall be underlain by at least 6 inches of aggregate base materials supported on at least 6 inches of engineered fill.

LEGEND

- Proposed Fill
- Proposed Cut
- 24" of over-excavation

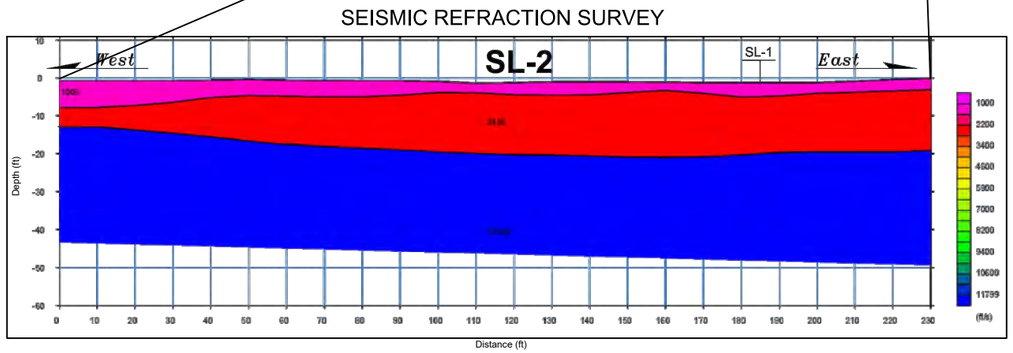
EXPLANATION



Notes:

1. Refer to Appendix A for detailed exploration descriptions.
2. Boring elevations approximated from Preliminary Costco Grading Plan prepared by Kier & Wright, dated 3/06/17.

SEISMIC REFRACTION SURVEY



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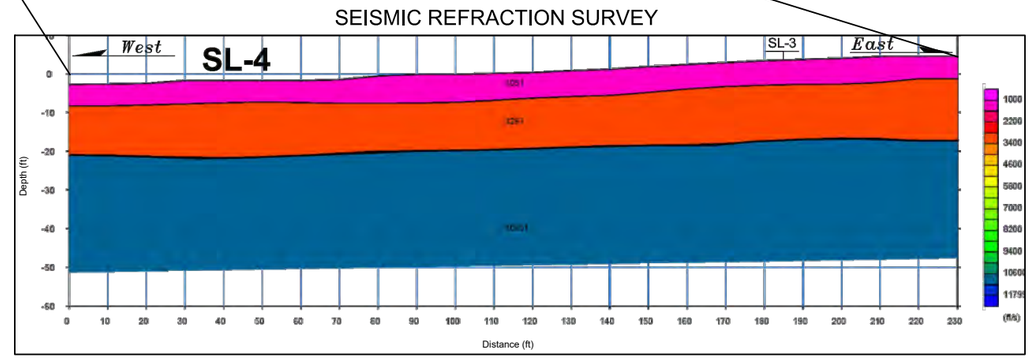

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APPROXIMATE HORIZONTAL SCALE: 1 inch = 100 feet

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CROSS SECTION A-A'

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE 3

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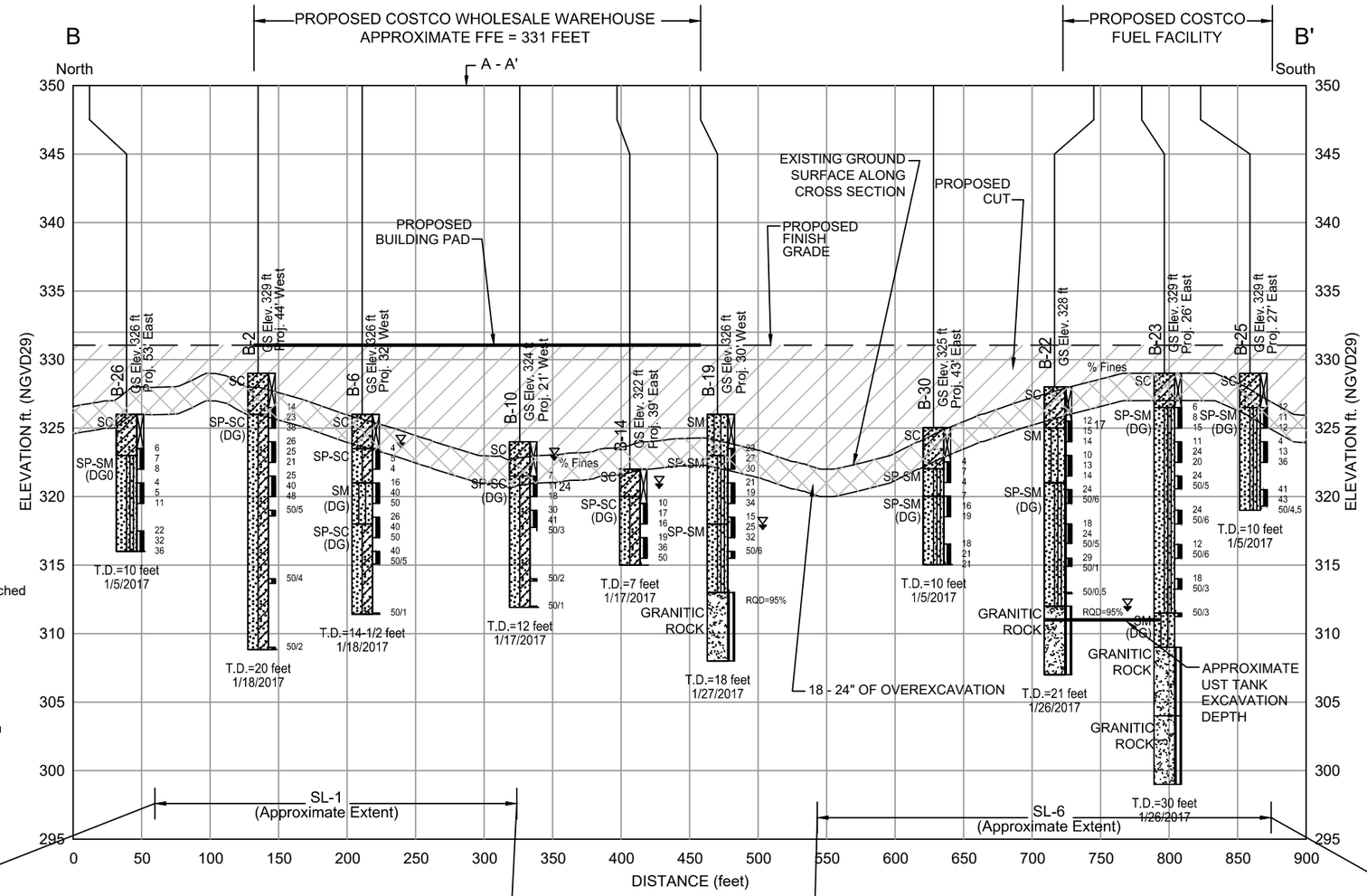
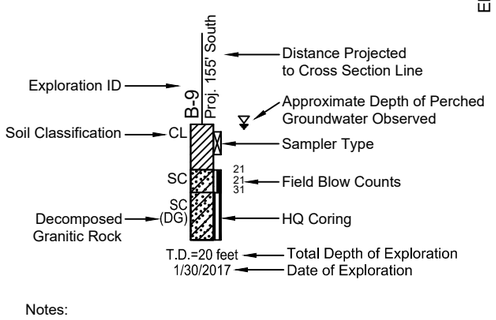


EXPLANATION



Notes:

1. Refer to Appendix A for detailed exploration descriptions.
2. Boring elevations approximated from Preliminary Costco Grading Plan prepared by Kier & Wright, dated 3/06/17.

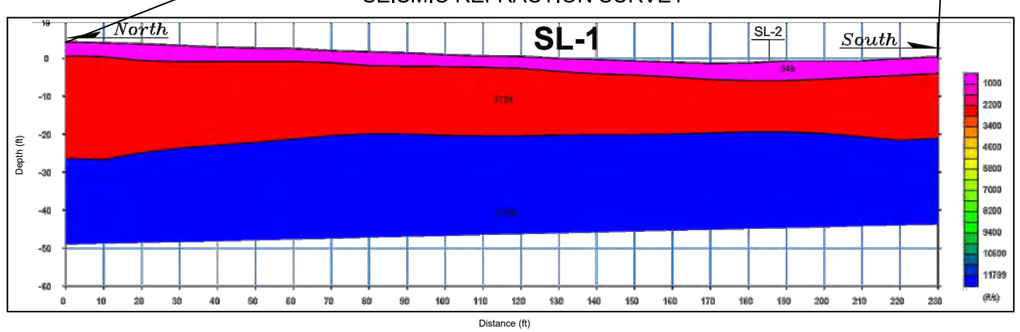
Notes:

1. Spread footings shall be overexcavated to a depth of at least 2 feet below existing grade, 3 feet below the bottom of the footings , or 3 feet below the bottom of the floor slabs, whichever is deeper.
2. Warehouse building slab shall be underlain by at least 6 inches of aggregate base materials supported on at least 6 inches of engineered fill.

LEGEND

- Proposed Fill
- Proposed Cut
- 24" of over-excavation

SEISMIC REFRACTION SURVEY



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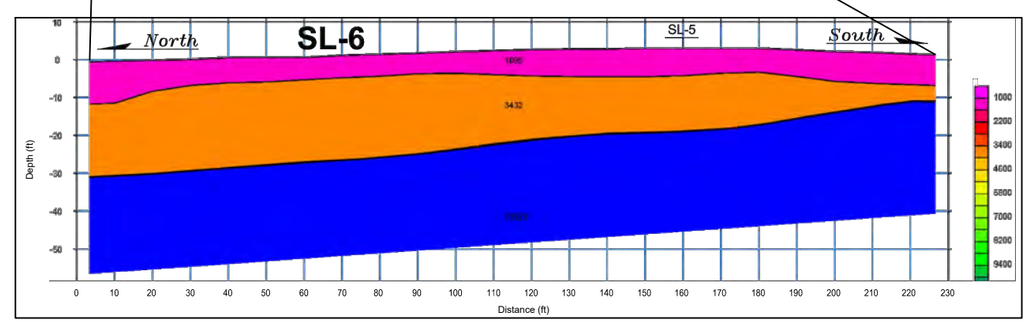

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CROSS SECTION B-B'

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE 4

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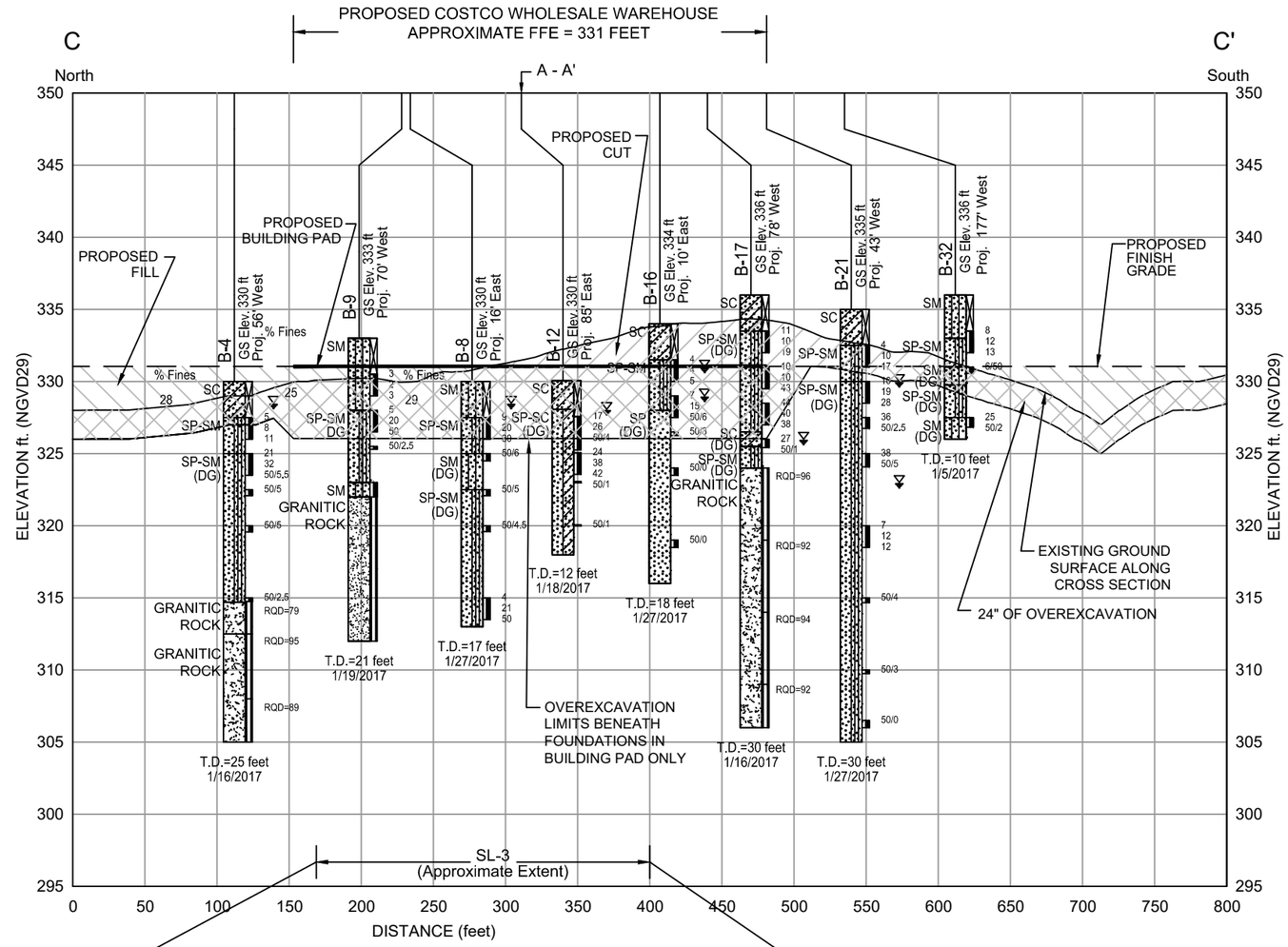


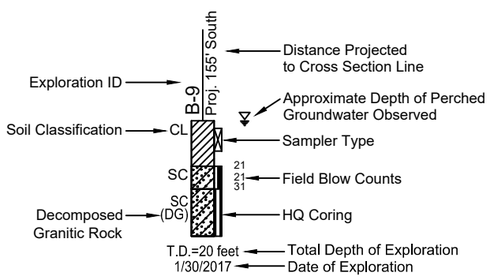
Notes:

1. Spread footings shall be overexcavated to a depth of at least 2 feet below existing grade, 3 feet below the bottom of the footings , or 3 feet below the bottom of the floor slabs, whichever is deeper.
2. Warehouse building slab shall be underlain by at least 6 inches of aggregate base materials supported on at least 6 inches of engineered fill.

LEGEND

- Proposed Fill
- Proposed Cut
- 24" of over-excavation

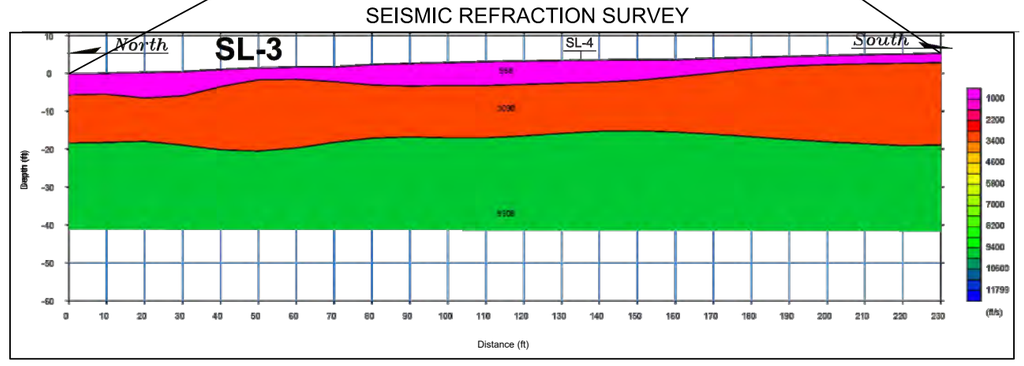
EXPLANATION



Notes:

1. Refer to Appendix A for detailed exploration descriptions.
2. Boring elevations approximated from Preliminary Costco Grading Plan prepared by Kier & Wright, dated 3/06/17.

SEISMIC REFRACTION SURVEY



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CROSS SECTION C-C'

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE 5

CAD FILE: K:\2017_PROJECTS\20173273.001A-COSTCO LOOMIS\cad\ LAYOUT: C-C

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Appendix A

APPENDIX A
FIELD EXPLORATIONS

APPENDIX A
FIELD EXPLORATIONS

GENERAL

Subsurface conditions at the site were explored by drilling 38 borings and excavating 10 test pits. The borings were drilled by Taber Drilling of West Sacramento, California using a CME-55 track-mounted, hollow-stem auger drilling and HQ-3 coring equipment to depths between approximately 7 to 30 feet below the existing ground surface (bgs) in the warehouse building area; approximately 10 feet bgs in the parking and drive areas; and between approximately 10 and 30 feet bgs in the fuel facility area. Seventeen of the borings (Borings B-1, B-4, B-6 through B-10, B-12 through B-19, B-22, and B-23) were terminated short of their planned depth due to practical auger refusal on bedrock. Eight of these borings that encountered refusal were cored to a depth of at least 4 feet into the bedrock (Borings B-4, B-7, B-9, B-17 through B-19, B-22, and B-23). The test pits were excavated by RAH Environmental of Rocklin, California using a tire-mounted backhoe (John Deere 160). Ten test pits were excavated to depths ranging from approximately 8 feet to 15 feet bgs. Five of these test pits were terminated short of their planned depth due to practical refusal on bedrock (Test Pits TP-2, TP-3, TP-7, TP-9, and TP-10). The approximate locations of the borings and test pits are presented on Figure 2. Elevations shown on the boring logs were estimated from the Preliminary Grading and Drainage Plan prepared by Kier and Wright (K&W No. A16658, Print date 3/06/2017).

The borings were drilled using track-mounted hollow-stem-auger drilling and HQ-3 rock coring equipment to depths between approximately 7 and 30 feet below the existing ground surface (bgs) in the warehouse building area; approximately 10 feet bgs in the parking and drive areas; and between approximately 10 and 30 feet bgs in the fuel facility area.

Prior to commencement of the fieldwork, Underground Service Alert (USA) was notified to identify potential conflicts with subsurface structures. A private utility locator was also subcontracted to scan for existing utilities at each of the proposed exploration locations.

The boring and test pit logs are presented as Figures A-4 through A-51. An explanation to the log is presented as Figures A-1 and A-2 and a Rock Description Key is provided as Figure A-3. The Boring/Test Pit Log describes the earth materials encountered, samples obtained and show field and laboratory tests performed. The log also shows the location, boring/test pit number, drilling/excavation date and the name of the drilling/excavation subcontractor. The borings and test pits were logged by a Kleinfelder engineer or geologist using the Unified Soil Classification

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System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Bulk and drive samples of selected earth materials were obtained from the borings and test pits.

A California sampler was used to obtain drive samples of the soil encountered. This sampler consists of a 3.0-inch O.D., 2.5-inch I.D. split barrel shaft that is driven a total of 18-inches into the soil at the bottom of the boring. The soil was retained in 6-inch brass tubes for laboratory testing. An additional 2 inches of soil from each drive remained in the cutting shoe and was usually discarded after visually classifying the soil. The sampler was driven using a 140-pound hammer falling 30 inches. The total number of blows required to drive the sampler the final 12 inches is termed blow count and is recorded on the Log of Boring. In some borings rock coring was performed when refusal was encountered above the target depth. This coring was completed using HQ-3 rock coring equipment and rock cores were collected, placed in cardboard core boxes, and transported to the Kleinfelder Sacramento laboratory.

The procedures we employed in the field are generally consistent with those described in ASTM Standard Test Method D1586.

Bulk and grab samples of the near-surface soils were directly retrieved from the auger cuttings from the borings and the excavated material in the test pits.

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SAMPLER AND DRILLING METHOD GRAPHICS

- BULK / GRAB / BAG SAMPLE
- MODIFIED CALIFORNIA SAMPLER (2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)
- CALIFORNIA SAMPLER (3 in. (76.2 mm.) outer diameter)
- STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
- HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)
- SHELBY TUBE SAMPLER
- PUSH TYPE SAMPLER
- SONIC CONTINUOUS SAMPLER
- HAND AUGER
- AUGER CUTTINGS

GROUND WATER GRAPHICS

- WATER LEVEL (level where first observed)
- WATER LEVEL (level after exploration completion)
- WATER LEVEL (additional levels after exploration)
- OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS
WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	**GRAVELS** (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu≥4 and 1≤Cc≤3	**GW**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			Cu<4 and/ or 1>Cc>3	**GP**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH 5% TO 12% FINES	Cu≥4 and 1≤Cc≤3	**GW-GM**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
			Cu<4 and/ or 1>Cc>3	**GP-GM**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH > 12% FINES		**GM**	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu≥6 and 1≤Cc≤3	**SW**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			Cu<6 and/ or 1>Cc>3	**SP**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH 5% TO 12% FINES	Cu≥6 and 1≤Cc≤3	**SW-SM**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
			Cu<6 and/ or 1>Cc>3	**SP-SM**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		SANDS WITH > 12% FINES		**SM**	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES

FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)	**ML**	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid Limit greater than 50)	**MH**	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

GRAPHICS KEY

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-1

PLOTTED: 03/21/2017 09:49 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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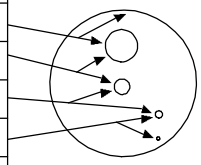
GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles		3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse	3/4 -3 in. (19 - 76.2 mm.)	3/4 -3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine	#4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines		Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller



SECONDARY CONSTITUENT

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N_{60} (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25 ≤ PP <0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5 ≤ PP <1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1 ≤ PP <2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2 ≤ PP <4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4 ≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N_{60} (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

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PROJECT NO.: 20173273
DRAWN BY: DR
CHECKED BY: BM
DATE: 1/18/2017
REVISED: 3/21/2017

SOIL DESCRIPTION KEY

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-2

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INFILLING TYPE

NAME	ABBR	NAME	ABBR
Albite	Al	Muscovite	Mus
Apatite	Ap	None	No
Biotite	Bi	Pyrite	Py
Clay	Cl	Quartz	Qz
Calcite	Ca	Sand	Sd
Chlorite	Ch	Sericite	Ser
Epidote	Ep	Silt	Si
Iron Oxide	Fe	Talc	Ta
Manganese	Mn	Unknown	Uk

DENSITY/SPACING OF DISCONTINUITIES

DESCRIPTION	SPACING CRITERIA
Unfractured	>6 ft. (>1.83 meters)
Slightly Fractured	2 - 6 ft. (0.061 - 1.83 meters)
Moderately Fractured	8 in - 2 ft. (203.20 - 609.60 mm)
Highly Fractured	2 - 8 in (50.80 - 203.30 mm)
Intensely Fractured	<2 in (<50.80 mm)

ADDITIONAL TEXTURAL ADJECTIVES

DESCRIPTION	RECOGNITION
Pit (Pitted)	Pinhole to 0.03 ft. (3/8 in.) (>1 to 10 mm.) openings
Vug (Vuggy)	Small openings (usually lined with crystals) ranging in diameter from 0.03 ft. (3/8 in.) to 0.33 ft. (4 in.) (10 to 100 mm.)
Cavity	An opening larger than 0.33 ft. (4 in.) (100 mm.), size descriptions are required, and adjectives such as small, large, etc., may be used
Honeycombed	If numerous enough that only thin walls separate individual pits or vugs, this term further describes the preceding nomenclature to indicate cell-like form.
Vesicle (Vesicular)	Small openings in volcanic rocks of variable shape and size formed by entrapped gas bubbles during solidification.

ADDITIONAL TEXTURAL ADJECTIVES

DESCRIPTION	CRITERIA
Unweathered	No evidence of chemical / mechanical alternation; rings with hammer blow.
Slightly Weathered	Slight discoloration on surface; slight alteration along discontinuities; <10% rock volume altered.
Moderately Weathered	Discoloring evident; surface pitted and alteration penetration well below surface; Weathering "halos" evident; 10-50% rock altered.
Highly Weathered	Entire mass discolored; Alteration pervading most rock, some slight weathering pockets; some minerals may be leached out.
Decomposed	Rock reduced to soil with relic rock texture/structure; Generally molded and crumbled by hand.

RELATIVE HARDNESS / STRENGTH DESCRIPTIONS

GRADE		UCS (Mpa)	FIELD TEST
R0	Extremely Weak	0.25 - 1.0	Indented by thumbnail
R1	Very Weak	1.0 - 5.0	Crumbles under firm blows of geological hammer, can be peeled by a pocket knife.
R2	Weak	5.0 - 25	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.
R3	Medium Strong	25 - 50	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single firm blow of a geological hammer.
R4	Strong	50 - 100	Specimen requires more than one blow of geological hammer to fracture it.
R5	Very Strong	100 - 250	Specimen requires many blows of geological hammer to fracture it.
R6	Extremely Strong	> 250	Specimen can only be chipped with a geological hammer.

ROCK QUALITY DESIGNATION (RQD)

DESCRIPTION	RQD (%)
Very Poor	0 - 25
Poor	25 - 50
Fair	50 - 75
Good	75 - 90
Excellent	90 - 100

APERTURE

DESCRIPTION	CRITERIA [in (mm)]
Tight	<0.04 (<1)
Open	0.04 - 0.20 (1 - 5)
Wide	>0.20 (>5)

BEDDING CHARACTERISTICS

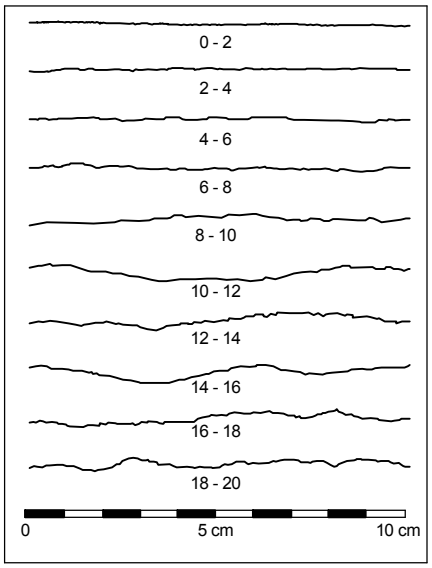
DESCRIPTION	Thickness [in (mm)]
Very Thick Bedded	>36 (>915)
Thick Bedded	12 - 36 (305 - 915)
Moderately Bedded	4 - 12 (102 - 305)
Thin Bedded	1 - 4 (25 - 102)
Very Thin Bedded	0.4 - 1 (10 - 25)
Laminated	0.1 - 0.4 (2.5 - 10)
Thinly Laminated	<0.1 (<2.5)

Bedding Planes — Planes dividing the individual layers, beds, or stratigraphy of rocks.

Joint — Fracture in rock, generally more or less vertical or traverse to bedding.

Seam — Applies to bedding plane with unspecified degree of weather.

JOINT ROUGHNESS COEFFICIENT (JRC)



From Barton and Choubey, 1977

RQD — Rock-quality designation (RQD) Rough measure of the degree of jointing or fracture in a rock mass, measured as a percentage of the drill core in lengths of 10 cm. or more.

CORE SAMPLER TYPE GRAPHICS

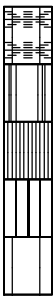
CORE SAMPLER

AQ CORE BARREL (1.067 in. (27.1 mm.) core diameter)

AX CORE BARREL (1.185 in. (30.1 mm.) core diameter)

BQ CORE BARREL (1.433 in. (36.4 mm.) core diameter)

CONTINUOUS CORE SAMPLE (2.000 in. (50.8 mm.) core diameter)



EX CORE BARREL (0.846 in. (21.5 mm.) core diameter)

HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)

NQ CORE SAMPLE (1.874 in. (47.6 mm.) core diameter)

NO RECOVERY CORE SAMPLE

NX CORE SAMPLE (2.154 in. (54.7 mm.) core diameter)

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

ROCK DESCRIPTION KEY

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

A-3

PLOTTED: 03/21/2017 09:49 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/26/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-1**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Clear	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057692.3755 (ft)
Easting: 6788165.0600 (ft)
Approximate Ground Surface Elevation (ft.): 328.00
Surface Condition: Grass

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, medium dense, fine to medium grained, trace gravel	1				SC				29	26	9	
325			**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown to yellowish brown, moist, medium dense, fine to coarse grained	1c, 1b		BC=13 20 20	18"								
	5			2c, 2b		BC=13 16 13	18"		9.8						
320			**Silty SAND (SM)**: brown, moist, very dense, fine to medium grained, trace gravel (Decomposed Granitic Rock)	3c, 3b		BC=6 50/6"	12"								
	10		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, moist, very dense, fine to coarse grained, angular to subangular gravel sized rock fragments (Decomposed Granitic Rock)	4c, 4b		BC=31 36 36	18"								
315															
	15		The boring was terminated because of practical auger refusal (↑) at approximately 14 ft. below ground surface. The boring was backfilled with neat cement grout on January 26, 2017.												
310															
	20														
305															
	25														
300															
	30														
295															

LABORATORY RESULTS

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/31/2017
REVISED:	3/21/2017

BORING LOG B-1

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-4

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/18/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-2**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Rainy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057688.4470 (ft)
Easting: 6788208.2289 (ft)
Approximate Ground Surface Elevation (ft.): 329.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained, low plasticity fines												
325	5		**Poorly graded SAND with Clay (SP-SC)**: light brown, white and black, moist, dense, fine to coarse grained sand (Decomposed Granitic Rock)	1a		BC=14 23 38			7.1	133.1					
				2a		BC=26 25 21									
320	10		very dense	3a		BC=25 40 48									
				4a		BC=50/5"									
315	15			5a		BC=50/4"									
310	20			6a		BC=50/2"									
305	25														
300	30														
295															

The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with neat cement grout on January 18, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/25/2017
REVISED:	3/21/2017

BORING LOG B-2

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-5

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/19/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-3**
Logged By:	M. Galouei	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Rainy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057694.7444 (ft)
Easting: 6788584.5365 (ft)
Approximate Ground Surface Elevation (ft.): 329.00
Surface Condition: Grass/mud

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to medium grained												
			Poorly graded SAND with Silt (SP-SM): light brown, moist, loose, fine to medium grained sand (Decomposed Granitic Rock)	1c, 1b		BC=3, 3, 7	18"		17.6	107.2					
325	5		dense	2c, 2b		BC=13, 26, 40	18"								
				3c, 3b		BC=22, 39, 50/5.5"	14"								
320	10			4c, 4b		BC=45, 50/2"	9"								
315	15			5c, 5b		BC=30, 20, 50/4"	11"								
310	20			6b		BC=50/5.5"	5"								
305	25														
300	30														
295															

The boring was terminated at approximately 21.5 ft. below ground surface. The boring was backfilled with neat cement grout on January 19, 2017.

GROUNDWATER LEVEL INFORMATION:
Perched groundwater was observed at approximately 2.5 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/25/2017
REVISED:	3/21/2017

BORING LOG B-3

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-6

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/16/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-4**
Logged By:	A. Tyler	**Drill Crew:**	Chad, Sean, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Overcast	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION — NAD83 CA State Planes, Zone II; Northing: 2057731.5907 (ft); Easting: 6788125.0795 (ft); Approximate Ground Surface Elevation (ft.): 330.00

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): dark brown, moist, fine to medium grained, trace gravel	1								28			
		Poorly graded SAND with Silt (SP-SM): light brown to dark brown, moist, medium dense, fine to coarse grained, trace gravel	1c, 1b		BC=5 8 11	18"		13.2						
325	5	**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, moist, very dense, fine to coarse grained sand, trace biotite minerals, angular to subangular gravel size rock fragments (Decomposed Granitic Rock)	2c, 2b		BC=21 32 50/5.5"	18"								
			3b		BC=50/5"	5"								
320	10	light brown to brown	4b		BC=50/5"	5"								
315	15		5b		BC=50/2.5"	3"								
		GRANITIC ROCK: brown to gray, fine to medium grained sand, very weak. highly weathered, highly to intensely fractured	Run 1			79%								Auger refusal at 15' 3", start coring RQD=43
		GRANITIC ROCK: gray, medium grained, massive, highly weathered, very weak to weak, moderately to highly fractured	Run 2			95%								RQD=95
310	20	gray to dark gray	Run 3			89%								RQD=81
305	25													
300	30													

The boring was terminated at approximately 25 ft. below ground surface. The boring was backfilled with neat cement grout on January 16, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 1.5 ft. below ground surface during drilling.
▼ Perched groundwater was observed at approximately 1 ft. below ground surface after drilling completion.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/26/2017
REVISED:	3/21/2017

BORING LOG B-4

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-7

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/17/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-5**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Not Available	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057518.5215 (ft)
Easting: 6788200.8520 (ft)
Approximate Ground Surface Elevation (ft.): 323.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained sand, low plasticity fines												
320			**Poorly graded SAND with Clay (SP-SC)**: light brown, white and black, moist, medium dense, fine to coarse grained sand (Decomposed Granitic Rock	1a		BC=9 13 16									
	5		**Poorly graded SAND with Clay (SP-SC)**: light brown, white and black, moist, very dense, fine to coarse grained sand (Decomposed Granitic Rock	2a		BC=16 26 50			9.1						
315				3a		BC=50/6"									
	10			4a		BC=50/5"									
310															
	15			5a		BC=19 35 50									
305															
	20			NR		BC=50/1"									
300															
	25														
295															
	30														
290															

The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with neat cement grout on January 17, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/26/2017
REVISED:	3/21/2017

BORING LOG B-5

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-8

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/18/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-6**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Rainy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057612.3890 (ft)
Easting: 6788302.3834 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
325			**Clayey SAND (SC)**: brown, moist, fine to medium grained												
			Poorly graded SAND with Clay (SP-SC): light brown, wet, loose, fine to coarse grained	1a		BC=4 5 4			13.9	112.8					
320	5		**Silty SAND (SM)**: light brown, wet, very dense, fine to coarse grained sand (Decomposed Granitic Rock)	2a		BC=16 40 50									
			Poorly graded SAND with Clay (SP-SC): light brown, white and black, wet, very dense, fine to coarse grained sand (Decomposed Granitic Rock)	3a		BC=26 40 50									
315	10			4a		BC=40 50/5"									
310	15			NR		BC=50/1"									
305	20														
300	25														
295	30														

The boring was terminated because of practical auger refusal (↑) at approximately 14.5 ft. below ground surface. The boring was backfilled with neat cement grout on January 18, 2017.

GROUNDWATER LEVEL INFORMATION:
⊻ Perched groundwater was observed at approximately 2 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/26/2017
REVISED:	3/21/2017

BORING LOG B-6

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-9

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/30/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-7**
Logged By:	M. Galouei	**Drill Crew:**	Chad, Sean, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057570.3686 (ft)
Easting: 6788276.2369 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
325			**Silty SAND (SM)**: dark brown, moist, fine to coarse grained												
			Poorly graded SAND with Silt and Gravel (SP-SM): light brownish gray, moist, very dense, fine to coarse grained (Decomposed Granitic Rock)	1c		BC=23 23 23	16"		8.3						
				1b											
	5			2b		BC=14 17 24									
320			**Clayey SAND (SC)**: moist, fine to coarse grained, medium plasticity fines	3c		BC=16 32 50/5"	14"								
			Poorly graded SAND with Silt and Gravel (SP-SM): moist, very dense, fine to medium grained (Decomposed Granitic Rock)	3b											
	10			4b		BC=24 32 42									
315			**Silty SAND (SM)**: pale olive, dry, very dense, fine to coarse grained (Decomposed Granitic Rock)												
	15		**GRANITE**: pale olive, dry, very dense, fine to coarse grained, medium plasticity fines, slightly weathered	Run 1			100%								RQD=39
310															
	20														
305															
	25														
300															
	30														
295															

The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with neat cement grout on January 30, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	2/1/2017
REVISED:	3/21/2017

BORING LOG B-7

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-10

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/27/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-8**
Logged By:	A. Tyler	**Drill Crew:**	Chad, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Partly cloudy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057611.8993 (ft)
Easting: 6788503.9972 (ft)
Approximate Ground Surface Elevation (ft.): 330.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown to dark brown, moist, fine to medium grained, trace gravel	1				SM				29	NP	NP	
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown to brown, wet, dense, fine to coarse grained	1c, 1b		BC=9 20 30	18"		9.2	125.3					
325	5		**Silty SAND (SM)**: gray, moist, very dense, fine grained, trace gravel (Decomposed Granitic Rock)	2b		BC=50/6"	3"								
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown to gray, moist, very dense, fine to coarse grained, subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)	3b		BC=50/5"									
320	10			4b		BC=50/4.5"	3"								
315	15			5c, 5b		BC=4 21 50	NR								
310	20														
305	25														
300	30														

The boring was terminated because of practical auger refusal (↑) at approximately 17 ft. below ground surface. The boring was backfilled with neat cement grout on January 27, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 1.5 ft. below ground surface during drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/31/2017
REVISED:	3/21/2017

BORING LOG B-8

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-11

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/19/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-9**
Logged By:	M. Galouei	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Rainy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057614.4943 (ft)
Easting: 6788645.8426 (ft)
Approximate Ground Surface Elevation (ft.): 333.00
Surface Condition: Grass/mud

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to coarse grained, non-plastic fines												
330			yellowish brown	1c, 1b		BC=3 2 3	12"		16.6	108.9		25			
	5		**Poorly graded SAND with Silt (SP-SM)**: olive, moist, fine to coarse grained sand (Decomposed Granitic Rock)	2c, 2b		BC=5 20 50	18"								
325			very dense	3b		BC=50/2.5"	NR								
	10		**Silty SAND (SM)**: light brownish gray, wet, very loose, fine to coarse grained sand (Decomposed Granitic Rock)	4b			NR								
			GRANITIC ROCK: black, white and gray, medium grained, slightly weathered, strong to very strong, slightly fractured, well defined foliation of silica and biotite minerals form dark and light banding, approximately 40° dip	Run 1			87.5%								RQD=80
320	15			Run 2			100%								RQD=73
315	20														
310	25														
305	30														
300															

The boring was terminated at approximately 21 ft. below ground surface. The boring was backfilled with neat cement grout on January 19, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was observed at approximately 2 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/26/2017
REVISED:	3/21/2017

BORING LOG B-9

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-12

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/17/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-10**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Not Available	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057497.0622 (ft)
Easting: 6788258.9676 (ft)
Approximate Ground Surface Elevation (ft.): 324.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained												
320	5		**Poorly graded SAND with Clay (SP-SC)**: light brown, white and black, wet, medium dense, fine to coarse grained (Decomposed Granitic Rock)	1a		BC=7 11 18			11.8						
				2a		BC=30 41 50/3"									
315	10		very dense	NR		BC=50/2"									
				NR		BC=50/1"									

The boring was terminated because of practical auger refusal (↑) at approximately 12 ft. below ground surface. The boring was backfilled with neat cement grout on January 17, 2017.

GROUNDWATER LEVEL INFORMATION:
Perched groundwater was observed at approximately 1 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/26/2017
REVISED:	3/21/2017

BORING LOG B-10

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-13

PLOTTED: 03/21/2017 10:01 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/30/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-11**
Logged By:	M. Galouei	**Drill Crew:**	Chad, Sean, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057616.1084 (ft)
Easting: 6788256.9070 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
325			**Silty SAND (SM)**: light brown, moist, fine to medium grained												
			Poorly graded SAND with Silt and Gravel (SP-SM): olive, moist, loose, fine to medium grained (Decomposed Granitic Rock)	1c 1b		BC=2 2 9	18"		12.6	115.0					
	5														
320			very dense, (Decomposed Granitic Rock)	2c 2b		BC=21 45 50/5"	17"								
			Silty SAND (SM): light brown, moist, very dense, fine to medium grained (Decomposed Granitic Rock)	3c 3b		BC=7 50/6"	8"								
	10														
315			**GRANITE**: light brownish gray, dry, medium dense, fine to medium grained, medium plasticity fines	4b		BC=5 26									
	15		dry to wet	5b		BC=24/2"									Difficult driling, rig shaking, sampler bouncing at 15 ft.
310															
▽															
	20														
305															
	25														
300															
	30														
295															

The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with neat cement grout on January 30, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 18 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	2/1/2017
REVISED:	3/21/2017

BORING LOG B-11

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-14

PLOTTED: 03/21/2017 10:02 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/18/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-12**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Rainy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057536.4161 (ft)
Easting: 6788183.8187 (ft)
Approximate Ground Surface Elevation (ft.): 330.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained												
			Poorly graded SAND with Clay (SP-SC): light brown, white and black, wet, very dense, fine to coarse grained (Decomposed Granitic Rock)	1a		BC=17 26 50/4"									
325	5		fine grained												
			fine to coarse grained	2a		BC=24 38 42									
				NR		BC=50/1"									
320	10			NR		BC=50/1"									
315	15														
310	20														
305	25														
300	30														

The boring was terminated because of practical auger refusal (↑) at approximately 12 ft. below ground surface. The boring was backfilled with neat cement grout on January 18, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 2 ft. below ground surface during drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/26/2017
REVISED:	3/21/2017

BORING LOG B-12

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-15

PLOTTED: 03/21/2017 10:02 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/27/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-13**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Clear	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057531.2986 (ft)
Easting: 6788343.6995 (ft)
Approximate Ground Surface Elevation (ft.): 335.00
Surface Condition: Grass/weeds

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained, trace gravel												
			Poorly graded SAND with Silt (SP-SM): light brown to brown, moist, very loose, fine to coarse grained, trace gravel	1c 1b		BC=3 2 2	18"		14.3	113.9					
330	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, moist, medium dense, fine to coarse grained, angular to subangular gravel sized rock fragments (Decomposed Granitic Rock)	2c 2b		BC=4 11 25	18"								
				3c 3b		BC=30 50/3"	8"								
325	10		very dense	4c 4b		BC=47 30 50/0"	7"								
320	15			5b		BC=40 50/0"	5"								
315	20					BC=50/0"	NR								
310	25														
305	30														

The boring was terminated because of practical auger refusal (↑) at approximately 22 ft. below ground surface. The boring was backfilled with neat cement grout on January 27, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 4.5 ft. below ground surface during drilling.
▼ Perched groundwater was observed at approximately 4 ft. below ground surface at the end of drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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DATE:	1/31/2017
REVISED:	3/21/2017

BORING LOG B-13

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-16

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Date Begin - End:	1/17/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-14**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Not Available	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057426.6927 (ft)
Easting: 6788267.7422 (ft)
Approximate Ground Surface Elevation (ft.): 322.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, wet, fine to medium grained	1								24			
320			**Poorly graded SAND with Clay (SP-SC)**: light brown, white and black, wet, medium dense, fine to coarse grained (Decomposed Granitic Rock)	1a		BC=10 17 16			11.8	121.9					
	5		very dense	2a		BC=19 36 50									
315															
	10														
310															
	15														
305															
	20														
300															
	25														
295															
	30														
290															

The boring was terminated because of practical auger refusal (↑) at approximately 7 ft. below ground surface. The boring was backfilled with neat cement grout on January 17, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 1 ft. below ground surface during drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-14

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-17

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Date Begin - End:	1/17/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-15**
Logged By:	B. Campbell	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Not Available	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057430.6545 (ft)
Easting: 6788330.0907 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Weeds/soil

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
325			**Clayey SAND (SC)**: dark brown, moist, fine to medium grained, low plasticity fines	1				SC-SM				31	25	7	
			Poorly graded SAND with Clay (SP-SC): light brown, white and black, moist, medium dense, fine to coarse grained (Decomposed Granitic Rock)	1a		BC=8 16 16			7.8	119.2					
	5		wet												
320			6 inch lens of Clayey SAND (SC)	2a		BC=5 5 19									
				3a		BC=50/6"									
			very dense												
	10			4a		BC=50/6"									
315															
310	15														
305	20														
300	25														
295	30														

The boring was terminated because of practical auger refusal (↑) at approximately 13 ft. below ground surface. The boring was backfilled with neat cement grout on January 17, 2017.

GROUNDWATER LEVEL INFORMATION:
⊻ Perched groundwater was observed at approximately 3 ft. below ground surface during drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-15

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-18

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Date Begin - End:	1/27/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-16**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Clear	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057439.1497 (ft)
Easting: 6788200.0548 (ft)
Approximate Ground Surface Elevation (ft.): 334.00
Surface Condition: Grass/weeds

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained, trace gravel												
330	5		**Poorly graded SAND with Silt (SP-SM)**: reddish brown, moist, loose, fine to coarse grained, trace gravel	1c 1b		BC=4 4 5			14.0	114.5					
			Poorly graded SAND (SP): light brown to brown, moist, very dense, fine to coarse grained, trace angular to subangular gravel sized rock fragments (Decomposed Granitic Rock)	2c 2b		BC=7 15 50/6"									
				3b		BC=50/3"									
325	10					BC=50/0"	NR								
320	15					BC=50/0"	NR								
315	20		The boring was terminated because of practical auger refusal (↑) at approximately 18 ft. below ground surface. The boring was backfilled with neat cement grout on January 27, 2017.												
310	25														
305	30														
300															

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 5 ft. below ground surface during drilling.
▼ Perched groundwater was observed at approximately 3 ft. below ground surface at the end of drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-16

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-19

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Date Begin - End:	1/16/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-17**
Logged By:	A. Tyler	**Drill Crew:**	Chad, Sean, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Hollow Stem Auger		
Weather:	Overcast	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION — NAD83 CA State Planes, Zone II
Northing: 2057402.9397 (ft)
Easting: 6788199.1934 (ft)
Approximate Ground Surface Elevation (ft.): 336.00

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
335			**Clayey SAND (SC)**: brown, dry, fine to medium grained, trace gravel												
			Poorly graded SAND with Silt (SP-SM): orange brown to brown, dry, medium dense, fine to coarse grained, trace gravel	1c, 1b		BC=11 10 19	18"		9.3						
	5		**Poorly graded SAND with Silt and Gravel**: light brown to brown, dry, dense, (Decomposed Granitic Rock)	2c, 2b		BC=10 10 43	18"								
330			moist, very dense	3c, 3b		BC=44 40 38	18"								
	10		**Clayey SAND (SC)**: brown, moist, very dense, fine to medium grained, trace gravel (Decomposed Granitic Rock)	4b		BC=27 50/1"									
325			**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown to brown, moist, fine to coarse grained, trace black mineral deposits (Decomposed Granitic Rock)	Run 1			96%								Auger refusal at 12 feet, start coring RQD=90
	15		**GRANITIC ROCK**: gray, medium grained, slightly weathered, strong, moderately to highly fractured (Decomposed Granitic Rock) gray to dark gray, moderately weathered, moderately strong	Run 2			92%								RQD=88
320	20		fine to medium grained	Run 3			94%								RQD=90
315	25		gray, medium grained, slightly weathered, strong, slightly fractured	Run 4			92%								RQD=92
310	30														
305															

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with neat cement grout on January 16, 2017.

GROUNDWATER LEVEL INFORMATION:
Perched groundwater was observed at approximately 10 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-17

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-20

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Date Begin - End:	1/30/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-18**
Logged By:	M. Galouei	**Drill Crew:**	Chad, Sean, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057379.5768 (ft)
Easting: 6788337.4983 (ft)
Approximate Ground Surface Elevation (ft.): 319.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
∇			**Silty SAND (SM)**: dark brown, wet, fine to coarse grained, medium plasticity fines, unpleasant odor												
315	5		**Poorly graded SAND with Silt (SP-SM)**: gray, moist, medium dense, fine to medium grained	1c 1b		BC=5 9 18	16"		14.9						
			Poorly graded SAND with Silt (SP-SM): gray, moist, very dense, fine to medium grained (Decomposed Granitic Rock)	2b		BC=15 40/6"									
310	10		**Granitic Rock**: white and gray, medium grained, slightly weathered, strong to very strong	Run 1			99%								RQD=82.5
305	15														
300	20														
295	25														
290	30														
285															

The boring was terminated at approximately 12 ft. below ground surface. The boring was backfilled with neat cement grout on January 30, 2017.

GROUNDWATER LEVEL INFORMATION:
∇ Perched groundwater was observed at approximately 1 ft. below ground surface during drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-18

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-21

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Date Begin - End:	1/27/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-19**
Logged By:	A. Tyler	**Drill Crew:**	Chad, Sean, Stephen		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Partly cloudy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057365.9022 (ft)
Easting: 6788268.3901 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
325			**Silty SAND (SM)**: brown, moist, fine to medium grained, trace gravel												
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown, moist, dense, fine to coarse grained (Decomposed Granitic Rock)	1c, 1b		BC=23 27 30	18"								
	5			2c, 2b		BC=21 19 34	18"								
320			**Poorly graded SAND with Silt (SP-SM)**: light brown to brown, moist, dense, fine to coarse grained, trace gravel sized rock fragments (Decomposed Granitic Rock) wet very dense	3c, 3b		BC=15 25 32	18"								
	10			4b		BC=50/6"	4"								
315			**GRANITE**: white, black and reddish brown, moderately to slightly weathered, medium strong to strong, slightly to highly fractured (Decomposed Granitic Rock)	Run 1			158%								RQD=92%
	15														
310															
	20														
305															
	25														
300															
	30														
295															

The boring was terminated at approximately 18 ft. below ground surface. The boring was backfilled with neat cement grout on January 27, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 8 ft. below ground surface during drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-19

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-22

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Date Begin - End:	1/27/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-20**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Partly cloudy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057363.2852 (ft)
Easting: 6788471.7900 (ft)
Approximate Ground Surface Elevation (ft.): 330.00
Surface Condition: Grass

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained, trace gravel												
			Silty SAND (SM): light brown to brown, moist, medium dense, fine to coarse grained, trace gravel	1c 1b		BC=11 11 16	18"		10.5	119.2		18			
325	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown to brown, moist, dense, fine to coarse grained, subangular to angular sized rock fragments (Decomposed Granitic Rock) very dense	2c 2b		BC=11 20 30	18"								
				3c 3b		BC=25 50/5"	11"								
320	10		**Silty SAND (SM)**: gray, dry, very dense, fine grained, trace gravel, decomposed to highly weathered (Decomposed Granitic Rock)	4b		BC=50/3.5"									
315	15					BC=50/0"	NR								
310	20					BC=50/3"	NR								
						BC=50/0"	NR								
305	25														
300	30														

The boring was terminated at approximately 25 ft. below ground surface. The boring was backfilled with neat cement grout on January 27, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-20

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-23

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Date Begin - End:	1/27/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-21**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Partly cloudy	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057363.3131 (ft)
Easting: 6788483.9803 (ft)
Approximate Ground Surface Elevation (ft.): 335.00
Surface Condition: Grass

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): brown, moist, fine to medium grained, trace gravel												
		Poorly graded SAND with Silt (SP-SM): reddish brown, moist, medium dense, fine to coarse grained, trace gravel	1c, 1b		BC=4, 10, 17	18"								
330	5	**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown to reddish brown, moist, medium grained, subangular to angular rock fragments (Decomposed Granitic Rock) coarse grained	2c, 2b		BC=10, 19, 28	18"		9.9						
		very dense	3c, 3b		BC=36, 50/2.5"	9"								
325	10		4c, 4b		BC=38, 50/5"	11"								
320	15	medium dense	5c, 5b		BC=7, 12, 12	18"								
315	20	brown to gray, very dense	6b		BC=50/4"	NR								
310	25		7b		BC=50/3"	NR								
					BC=50/0"	NR								
305	30													

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with neat cement grout on January 27, 2017.

GROUNDWATER LEVEL INFORMATION:
Perched groundwater was observed at approximately 12 ft. below ground surface during drilling.
Perched groundwater was observed at approximately 5 ft. below ground surface at the end of drilling.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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BORING LOG B-21

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-24

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PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/26/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-22**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Clear	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION — NAD83 CA State Planes, Zone II
Northing: 2057078.3184 (ft)
Easting: 6788355.0874 (ft)
Approximate Ground Surface Elevation (ft.): 328.00
Surface Condition: Grass

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): brown, moist, fine to medium grained, trace gravel												
325		**Silty SAND (SM)**: light brown to orange brown, moist, medium dense, fine to coarse grained, trace gravel	1c, 1b		BC=12 15 14	18"					23			
	5		2c, 2b		BC=10 13 14	18"		12.6	115.5					
320		**Poorly graded SAND with Silt and Gravel**: light brown to brown, moist, very dense, fine to coarse grained, subangular to angular rock fragments (Decomposed Granitic Rock)	3c, 3b		BC=24 50/6"	12"								
	10		4c, 4b		BC=18 24 50/5"	18"								
315			5c, 5b		BC=29 50/1"	NR								
	15		6c		BC=50/0.5"	NR								
		GRANITIC ROCK: gray, white and black, medium grained, strong, moderately to highly weathered	Run 1			95%								RQD=92%
310	20													
305	25													
300	30													
295														

The boring was terminated at approximately 21 ft. below ground surface. The boring was backfilled with neat cement grout on January 26, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Perched groundwater was observed at approximately 16 ft. below ground surface during drilling.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

KLEINFELDER
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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/31/2017
REVISED:	3/21/2017

BORING LOG B-22

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-25

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/26/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-23**
Logged By:	A. Tyler	**Drill Crew:**			
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Clear	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION — NAD83 CA State Planes, Zone II; Northing: 2057044.2923 (ft); Easting: 6788635.5245 (ft); Approximate Ground Surface Elevation (ft.): 329.00; Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): brown, moist, fine to medium grained												
325	5	**Poorly graded SAND with Silt (SP-SM)**: light brown to brown, moist, medium dense, fine to coarse grained, trace gravel (Decomposed Granitic Rock)	1c, 1b		BC=6 8 15	18"		10.1	119.1		17			
			2c, 2b		BC=11 24 20	18"		7.0	126.1					
320	10		3c, 3b		BC=24 50/5"	11"								
			4c, 4b		BC=24 50/6"	12"								
315	15		5c, 5b		BC=12 50/6"	12"								
			6c, 6b		BC=18 50/3"	9"								
310	20	**Silty SAND (SM)**: brown, dry, very dense, fine to medium grained, trace gravel (Decomposed Granitic Rock)	7b		BC=50/3"	3"								
305	25	**GRANITIC ROCK**: gray, white and black, fine to medium grained, moderately to highly weathered, medium strong, moderately to highly fractured, moderately foliated	Run 1			93%								RQD=58%
300	30	**GRANITIC ROCK**: gray, white and black, medium grained, slightly weathered, strong, moderately fractured	Run 2			97%								RQD=85%
295														

The boring was terminated at approximately 30 ft. below ground surface. The boring was backfilled with neat cement grout on January 26, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	2/1/2017
REVISED:	3/21/2017

BORING LOG B-23

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-26

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-24**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057004.9583 (ft)
Easting: 6788584.1803 (ft)
Approximate Ground Surface Elevation (ft.): 328.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained, medium plasticity fines	1											**R-Value=** 10
325			**Silty SAND (SM)**: brown, moist, dense, fine to coarse grained (Decomposed Granitic Rock)	1c 1b		BC=7 17 32	15"		15.0						
	5		very dense	2c 2b		BC=26 40 36	18"								
320				3c 3b		BC=15 50/5"	12"								
	10														
315															
	15														
310															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-24

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-27

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-25**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057001.3816 (ft)
Easting: 6788511.9588 (ft)
Approximate Ground Surface Elevation (ft.): 329.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, firm, fine to medium grained, medium plasticity fines												
			Poorly graded SAND with Silt (SP-SM): light brown, moist, medium dense, fine to coarse grained (Decomposed Granitic Rock)	1c		BC=12 11 12	18"		11.0	118.3					
				1b											
325															
	5					BC=4 13 36	12"								
				2c											
			dense	2b											
						BC=41 43 50/4.5"	12"								
320			very dense	3c											
	10			3b											
315															
	15														
310															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-25

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-28

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-26**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057813.8003 (ft)
Easting: 6788450.5877 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained												
325						BC=6 7 8	18"								
			Poorly graded SAND with Silt (SP-SM): brown, moist, medium dense, weakly cemented, fine to corase grained (Decomposed Granitic Rock)	1c 1b											
	5					BC=4 5 11	17"								
320				2c 2b											
			very dense, strongly cemented			BC=22 32 36	18"								
				3c 3b											
	10														
315															
	15														
310															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-26

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-29

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-27**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057738.2118 (ft)
Easting: 6788460.2932 (ft)
Approximate Ground Surface Elevation (ft.): 325.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained	1				SC				35	27	9	**R-Value=** 26
						BC=9 20 26	18"								
			Poorly graded SAND with Silt (SP-SM): brown, moist, dense, moderately cemented, fine to coarse grained (Decomposed Granitic Rock)	1c											
				1b											
320	5					BC=18 28 45	17"								
				2c											
			very dense	2b											
						BC=24 50 50/4.5"	18"								
				3c											
				3b											
315	10														
310	15														

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-27

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-30

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-28**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057673.7481 (ft)
Easting: 6788521.5986 (ft)
Approximate Ground Surface Elevation (ft.): 333.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, fine to medium grained	1				SM				30	NP	NP	**R-Value=** 17
330				1c 1b		BC=3 5 5	18"								
			loose												
	5			2c 2b		BC=10 9 13	18"								
			Poorly graded SAND with Silt (SP-SM): gray, moist, medium dense, fine to medium grained												
325			**Clayey SAND (SC)**: gray, dry, very dense, fine to medium grained, low plasticity fines (Decomposed Granitic Rock)												
						BC=50	6"								
	10		**Sandy Lean CLAY (CL)**: medium plasticity, light brown, medium plasticity, dry, very hard, (Decomposed Granitic Rock)												
320															
	15														
315															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

KLEINFELDER
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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-28

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-31

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-29**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057403.5313 (ft)
Easting: 6788612.9750 (ft)
Approximate Ground Surface Elevation (ft.): 339.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, fine to medium grained												
						BC=7 7 8	18"								
			Poorly graded SAND with Silt (SP-SM): light brown, moist, medium dense, fine to medium grained (Decomposed Granitic Rock)	1c											
				1b											
335															
	5			2c		BC=26 50/5.5"	11"								
			very dense	2b											
				3c		BC=19 50/4"	12"								
330				3b											
	10														
325															
	15														
320															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

KLEINFELDER
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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-29

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-32

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-30**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057195.8325 (ft)
Easting: 6788669.9373 (ft)
Approximate Ground Surface Elevation (ft.): 325.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Clayey SAND (SC): brown, moist, fine to medium grained												
			Poorly graded SAND with Silt (SP-SM): brown, moist, loose, fine to medium grained	1c 1b		BC=4 7 4	12"								
320	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: brown, moist, medium dense, fine to coarse grained, subangular to angular rock fragments (Decomposed Granitic Rock)	2c 2b		BC=7 16 19	15"								
			dense	3c 3b		BC=18 21 21	18"								
315	10														
310	15														

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

KLEINFELDER
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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-30

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-33

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-31**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057208.0591 (ft)
Easting: 6788660.6181 (ft)
Approximate Ground Surface Elevation (ft.): 326.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
325			**Silty SAND (SM)**: brown, moist, fine to medium grained												
			Poorly graded SAND with Silt (SP-SM): light brown, moist, very dense, fine to coarse grained (Decomposed Granitic Rock)	1c 1b		BC=11 27 49	18"								
	5			2c 2b		BC=42 50/4"	12"								
320															
				3b		BC=50/3"	3"								
	10														
315															
	15														
310															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-31

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-34

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-32**
Logged By:	A. Tyler	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057305.2054 (ft)
Easting: 6788821.4205 (ft)
Approximate Ground Surface Elevation (ft.): 336.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
335			**Silty SAND (SM)**: dark brown, moist, fine to coarse grained, trace gravel												
			Poorly graded SAND with Silt and Gravel (SP-SM): reddish brown to light brown, moist, medium dense, fine to coarse grained	1c 1b		BC=8 12 13	16"								
	5		**Silty SAND (SM)**: brown, moist, very dense, fine to medium grained, trace gravel (Decomposed Granitic Rock)	2b		BC=6/50"	6"								
330			**Poorly graded SAND with Silt and Gravel (SP-SM)**: brown to light brown, moist, fine to medium grained, subangular to angular rock fragments (Decomposed Granitic Rock)												
			Silty SAND (SM): light brown, moist, very dense, fine to medium grained (Decomposed Granitic Rock)	3c 3b		BC=25 50/2"	10"								
	10														
325															
	15														
320															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-32

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-35

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
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Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-33**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057204.5618 (ft)
Easting: 6788731.6924 (ft)
Approximate Ground Surface Elevation (ft.): 324.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, firm, fine to medium grained, medium plasticity fines	1				SM				29	NP	NP	**R-Value=** 18
			Poorly graded SAND with Silt (SP-SM): light brown, moist, medium dense, fine to coarse grained (Decomposed Granitic Rock)	1c 1b		BC=9 14 16	18"								
320	5			2c 2b		BC=8 10 26	12"								
315	10		very dense	3b		BC=50/6"	6"								

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

310

15

305

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PROJECT NO.:	20173273
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DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-33

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

A-36

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
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Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-34**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057210.9812 (ft)
Easting: 6788683.6622 (ft)
Approximate Ground Surface Elevation (ft.): 332.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, fine to medium grained	1				SM				30	NP	NP	**R-Value=** 30
330						BC=4 3 4	16"								
			Poorly graded SAND with Silt (SP-SM): brown, moist, loose, fine to medium grained	1c / 1b											
			Silty SAND (SM): brown, wet, loose, fine to medium grained												
	5			2c		BC=32 50/4"	9"								
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown, moist, very dense, fine to coarse grained (Decomposed Granitic Rock)	2b											
325															
				3b		BC=50/5"	6"								
			Sandy Lean CLAY (CL): medium plasticity, brown, moist, very hard, fine to coarse grained (Decomposed Granitic Rock)												
	10														
320															
	15														
315															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
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DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-34

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-37

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
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Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-35**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057195.7244 (ft)
Easting: 6788671.3991 (ft)
Approximate Ground Surface Elevation (ft.): 335.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, fine to medium grained												
			Poorly graded SAND with Clay (SP-SC): brown, moist, very dense, fine to medium grained, low plasticity fines (Decomposed Granitic Rock)	1c 1b		BC=8 50/5"									
330	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, moist, very dense, fine to coarse grained, subangular gravel (Decomposed Granitic Rock)	2c 2b		BC=28 50/4"									
				3b		BC=50/3.5"									
325	10														
320	15														

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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REVISED:	3/21/2017

BORING LOG B-35

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-38

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
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Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-36**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057094.7292 (ft)
Easting: 6788766.7562 (ft)
Approximate Ground Surface Elevation (ft.): 330.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, fine to medium grained												
			medium dense	1c 1b		BC=9 11 15	17"								
325	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, moist, dense, fine to coarse grained (Decomposed Granitic Rock)	2c 2b		BC=15 29 40	18"								
			very dense	2c 2b		BC=47 50/4.5"	12"								
320	10														
315	15														

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
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REVISED:	3/21/2017

BORING LOG B-36

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-39

PLOTTED: 03/21/2017 10:03 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
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Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-37**
Logged By:	A. Tyler	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057001.6168 (ft)
Easting: 6788429.3053 (ft)
Approximate Ground Surface Elevation (ft.): 332.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, fine to medium grained												
330			**Poorly graded SAND (SP)**: yellowish brown, moist, dense, fine to medium grained	1c 1b		BC=9 22 38	12"								
	5		**Poorly graded SAND with Silt (SP-SM)**: olive brown, moist, very dense, fine to medium grained (Decomposed Granitic Rock)	2c 2b		BC=22 34 39	18"								
325			**Poorly graded SAND with Silt and Gravel (SP-SM)**: yellowish brown, moist, very dense, fine to coarse grained (Decomposed Granitic Rock)	3c 3b		BC=24 50/2.5"	12"								
	10														
320															
	15														
315															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
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DATE:	1/18/2017
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BORING LOG B-37

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-40

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PROJECT NUMBER: 20173273.001A
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gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/05/2017	**Drilling Company:**	Taber Drilling		**BORING LOG B-38**
Logged By:	M. Galouei	**Drill Crew:**	Chad, David, Rick		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger		
Weather:	Sunny	**Auger Diameter:**	4 in. O.D.		

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057003.0856 (ft)
Easting: 6788261.6934 (ft)
Approximate Ground Surface Elevation (ft.): 338.00
Surface Condition: Grass

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in.	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): brown, moist, fine to medium grained												
335															
	5		**Poorly graded SAND (SP)**: brown, moist, very dense, fine to medium grained (Decomposed Granitic Rock)	2c 2b		BC=40 50/4"	12"								
			Poorly graded SAND with Silt (SP-SM): light brown, moist, very dense, fine to medium grained (Decomposed Granitic Rock)	3b		BC=50/5"	6"								
330															
				4c 4b		BC=33 50/4.5"	12"								
	10														
325															
	15														
320															

The boring was terminated at approximately 10 ft. below ground surface. The boring was backfilled with soil cuttings on January 05, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
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DATE:	1/18/2017
REVISED:	3/21/2017

BORING LOG B-38

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-41

PLOTTED: 03/21/2017 10:04 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/13/2017	**Excavation Company:**	RAH		**TEST PIT LOG TP-1**
Logged By:	M. Galouei	**Excavation Crew:**	Craig		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160		
Plunge:	N/A	**Excav. Dimensions:**	2 ft		
Weather:	Sunny				

FIELD EXPLORATION — NAD83 CA State Planes, Zone II; Northing: 2057714.8391 (ft); Easting: 6788528.7631 (ft); Approximate Ground Surface Elevation (ft.): 329.00; Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to medium grained										
325	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: yellowish brown, moist, medium to coarse grained sand and gravel										
320	10		**Poorly graded SAND with Silt and Gravel (SP-SM)**: yellowish brown, wet, fine to corase grained subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)										
			increasing coarse gravel sized rock fragments										
315	15												
310													

The test pit was terminated at approximately 15 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 5 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
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DATE:	1/18/2017
REVISED:	3/21/2017

TEST PIT LOG TP-1

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-42

PLOTTED: 03/21/2017 10:04 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	1/13/2017	**Excavation Company:**	RAH
Logged By:	M. Galouei	**Excavation Crew:**	Craig
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160
Plunge:	N/A	**Excav. Dimensions:**	2 ft
Weather:	Sunny		

TEST PIT LOG TP-2

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057650.2531 (ft)
Easting: 6788672.7414 (ft)
Approximate Ground Surface Elevation (ft.): 327.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to medium grained										
325			**Poorly graded SAND with Silt (SP-SM)**: light brown, moist, fine to coarse grained										
	5												
320			**Poorly graded SAND with Silt (SP-SM)**: light brown, wet, fine to coarse grained (Decomposed Granitic Rock)										
	10		saturated										
315													
	15												
310													

The test pit was terminated because of excavator refusal (↑) at approximately 11 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 10 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
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DATE:	1/18/2017
REVISED:	3/21/2017

TEST PIT LOG TP-2

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

A-43

PLOTTED: 03/21/2017 10:04 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	1/13/2017	**Excavation Company:**	RAH
Logged By:	M. Galouei	**Excavation Crew:**	Craig
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160
Plunge:	N/A	**Excav. Dimensions:**	2 ft
Weather:	Sunny		

TEST PIT LOG TP-3

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057697.8134 (ft)
Easting: 6788215.1864 (ft)
Approximate Ground Surface Elevation (ft.): 330.00
Surface Condition: Grass/mud

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to coarse grained										
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown, moist, fine to coarse gravel (Decomposed Granitic Rock)										
			GRANITIC ROCK: gray, fine to medium grained										
325	5												
320	10												
315	15												

LABORATORY RESULTS

The test pit was terminated because of excavator refusal (↑) at approximately 8 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 3 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

TEST PIT LOG TP-3

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-44

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Date Begin - End:	1/13/2017	**Excavation Company:**	RAH
Logged By:	M. Galouei	**Excavation Crew:**	Craig
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160
Plunge:	N/A	**Excav. Dimensions:**	2 ft
Weather:	Sunny		

TEST PIT LOG TP-4

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057492.2498 (ft)
Easting: 6788273.7869 (ft)
Approximate Ground Surface Elevation (ft.): 337.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to coarse grained										
335			**Poorly graded SAND with Silt and Gravel (SP-SM)**: brown, moist, fine to coarse grained sand and gravel										
	5		**Poorly graded SAND with Silt (SP-SM)**: light brown, moist, fine to coarse grained										
330													
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown, moist, fine to coarse subangular gravel sized rock fragments (Decomposed Granitic Rock)										
	10												
325			wet										
	15												
320													

The test pit was terminated at approximately 15 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 5.5 ft. below ground surface during excavation.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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DATE:	1/18/2017
REVISED:	3/21/2017

TEST PIT LOG TP-4

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-45

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Date Begin - End:	1/13/2017	**Excavation Company:**	RAH		**TEST PIT LOG TP-5**
Logged By:	M. Galouei	**Excavation Crew:**	Craig		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160		
Plunge:	N/A	**Excav. Dimensions:**	2 ft		
Weather:	Sunny				

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057426.4580 (ft)
Easting: 6788830.4943 (ft)
Approximate Ground Surface Elevation (ft.): 320.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown, moist, fine to medium grained										
			Poorly graded SAND with Silt and Gravel (SP-SM): light brown, moist, fine to coarse grained subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)										
315	5												
310	10												
305	15												

The test pit was terminated at approximately 14.5 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 1 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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TEST PIT LOG TP-5

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

A-46

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Date Begin - End:	1/12/2017	**Excavation Company:**	RAH
Logged By:	M. Galouei	**Excavation Crew:**	Craig
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160
Plunge:	N/A	**Excav. Dimensions:**	2 ft
Weather:	Rainy		

TEST PIT LOG TP-6

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057350.7913 (ft)
Easting: 6788921.4444 (ft)
Approximate Ground Surface Elevation (ft.): 330.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Sandy SILT (ML): dark brown, wet										
			Silty SAND (SM): brown, fine to medium grained										
∿			**Poorly graded SAND with Silt and Gravel (SP-SM)**: brown, fine to medium grained sand, subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)										
			Poorly graded SAND with Silt (SP-SM): light brown, wet, fine to medium grained										
325	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, wet, fine to medium grained, subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)										Difficult excavation conditions beginning at approximately 9 feet
320	10												
315	15												

The test pit was terminated at approximately 10 ft. below ground surface. The test pit was backfilled with soil on January 12, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 3 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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TEST PIT LOG TP-6

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-47

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Date Begin - End:	1/13/2017	**Excavation Company:**	RAH
Logged By:	M. Galouei	**Excavation Crew:**	Craig
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160
Plunge:	N/A	**Excav. Dimensions:**	2 ft
Weather:	Sunny		

TEST PIT LOG TP-7

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057615.5134 (ft)
Easting: 6788852.1899 (ft)
Approximate Ground Surface Elevation (ft.): 335.00
Surface Condition: Grass/mud

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Sandy SILT with Gravel (ML): brown, medium to coarse grained										
			Silty SAND (SM): dark brown to brown, medium to coarse grained										
			Poorly graded SAND (SP): brown, medium to coarse grained										
330	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, wet, fine to coarse grained, subangular gravel sized rock fragments (Decomposed Granitic Rock)										
			Silty SAND with Gravel (SM): light brown, coarse sand, gsubangular gravel sized rock fragments (Decomposed Granitic Rock) concrete pipe at 7 feet										
325	10												
320	15												

LABORATORY RESULTS

The test pit was terminated because of excavator refusal (↑) at approximately 10 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 4 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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TEST PIT LOG TP-7

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-48

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Date Begin - End:	1/12/2017	**Excavation Company:**	RAH
Logged By:	B. Anderson	**Excavation Crew:**	Craig
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160
Plunge:	N/A	**Excav. Dimensions:**	2 ft
Weather:	Rainy		

TEST PIT LOG TP-8

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057101.2157 (ft)
Easting: 6788860.7550 (ft)
Approximate Ground Surface Elevation (ft.): 328.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Sandy SILT (ML): brown, moist, fine to coarse grained sand, organics in upper 6 inches										
325			**Silty SAND (SM)**: reddish brown, moist, fine to coarse grained, abundant mica										
	5		**Clayey SAND (SC)**: light brown, moist, fine to coarse grained, low plasticity fines (Decomposed Granitic Rock)										
320													
	10		**GRANITIC ROCK**: light brown to white, black and reddish brown, decomposed to highly weathered, very weak (R0), fine to coarse grained sand , occasional cobble and gravel sized rock fragments, intensely fractured										
315			highly weathered										
	15												
310													

The test pit was terminated at approximately 15 ft. below ground surface. The test pit was backfilled with soil on January 12, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 6 ft. below ground surface during excavation.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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TEST PIT LOG TP-8

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-49

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Date Begin - End:	1/12/2017	**Excavation Company:**	RAH		**TEST PIT LOG TP-9**
Logged By:	B. Anderson	**Excavation Crew:**	Craig		
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160		
Plunge:	N/A	**Excav. Dimensions:**	2 ft		
Weather:	Rainy				

FIELD EXPLORATION — NAD83 CA State Planes, Zone II
Northing: 2057069.3849 (ft)
Easting: 6788357.0504 (ft)
Approximate Ground Surface Elevation (ft.): 333.00
Surface Condition: Grass/mud

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): wet, fine to medium grained										
			Sandy SILT (ML): reddish brown, moist, fine to coarse grained										
330			**Poorly graded SAND with Silt (SP-SM)**: brown, fine to coarse grained										
	5		**Poorly graded SAND with Gravel (SP)**: light brown, fine to coarse grained, subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)										
325			**GRANITIC ROCK**: light brown to white, black and reddish brown, decomposed to highly weathered, very weak (R0), fine to coarse grained sand , occasional cobble and gravel sized rock fragments, intensely fractured										
	10												
320													
	15												
315													

The test pit was terminated because of excavator refusal (↑) at approximately 10 ft. below ground surface. The test pit was backfilled with soil on January 12, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.
GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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TEST PIT LOG TP-9

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-50

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Date Begin - End:	1/13/2017	**Excavation Company:**	RAH	**TEST PIT LOG TP-10**
Logged By:	B. Anderson	**Excavation Crew:**	Craig	
Hor.-Vert. Datum:	NAD83 - NGVD29	**Excavation Equip.:**	John Deere 160	
Plunge:	N/A	**Excav. Dimensions:**	2 ft	
Weather:	Sunny			

FIELD EXPLORATION

NAD83 CA State Planes, Zone II
Northing: 2057738.2118 (ft)
Easting: 6788165.0600 (ft)
Approximate Ground Surface Elevation (ft.): 325.00
Surface Condition: Grass/mud

LABORATORY RESULTS

Approximate Elevation (feet)	Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Silty SAND (SM): dark brown										
			Poorly graded SAND with Silt (SP-SM): yellowish brown to brown, fine to medium grained										
320	5		**Poorly graded SAND with Silt and Gravel (SP-SM)**: light brown, fine to coarse grained sand, subangular to angular gravel sized rock fragments (Decomposed Granitic Rock)										
			Poorly graded SAND with Silt (SP-SM): light brown, fine to medium grained (Decomposed Granitic Rock)										
315	10												
310	15												

The test pit was terminated because of excavator refusal (↑) at approximately 11 ft. below ground surface. The test pit was backfilled with soil on January 13, 2017.

GROUNDWATER LEVEL INFORMATION:
∿ Seepage was observed at approximately 3 ft. below ground surface during excavation.

GENERAL NOTES:
The exploration elevation is approximate and was estimated from the Preliminary Grading and Drainage Plan prepared by Kier & Wright.

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TEST PIT LOG TP-10

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
A-51

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Appendix B

APPENDIX B
LABORATORY TESTING

APPENDIX B
LABORATORY TESTING

GENERAL

Laboratory tests were performed on selected samples as an aid in classifying the soils and to evaluate physical properties of the soils that may affect foundation design and construction procedures. The tests were performed in general conformance with the current ASTM or Caltrans standards. A description of the laboratory-testing program is presented below.

MOISTURE AND UNIT WEIGHT

Moisture content and dry unit weight tests were performed on selected samples recovered from the borings. Moisture contents were determined in general accordance with ASTM Test Method D 2216; dry unit weight was calculated using the entire weight of the samples collected. Results of these tests are presented on the boring logs.

WASH SIEVE

Selected soil samples were tested for the percent passing the No. 200 sieve, which was performed by wash sieving in accordance with ASTM Standard Test Method D 1140. The test results are presented on the boring logs.

GRAIN SIZE DISTRIBUTION

The grain-size distribution was determined for selected samples of the materials encountered at the site to aid in their classification. The tests were performed in general accordance with ASTM Test Method D422. These tests were performed on the gravel to clay fraction of the sample, the cobbles and boulders were removed from the test. Results of the testing are attached to this appendix.

PLASTICITY INDEX

Plasticity Index (liquid and plastic limit) testing was performed on selected samples of the on-site soils to determine plasticity characteristics and to aid in the classification of the soil. The tests were performed in accordance with ASTM Standard Test Method D 4318. The results are presented on the boring logs and attached to this appendix.

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R-VALUE

Resistance value (R-value) tests were performed on selected bulk soil samples obtained to evaluate pavement support characteristics of the near-surface onsite soils. R-value tests were performed in accordance with Caltrans Standard Test Method 301. The test results are attached.

PRELIMINARY SOIL CORROSIVITY

A series of chemical tests were performed on a selected sample of the near-surface soils to estimate pH, resistivity, oxidation reduction potential, redox, and soluble sulfate and chloride contents. The sample was tested in general accordance with California Test Methods 643, 422, and 417 for pH and minimum resistivity, soluble chlorides, and soluble sulfates, respectively, ASTM G-200 for Redox Potential, and AWWA C105/A25.5 for Sulfides. Test results may be used by a qualified corrosion engineer to evaluate the general corrosion potential with respect to construction materials. The tests were performed by Sunland Analytical of Rancho Cordova, California. The results of the tests are presented in Table 6 of Section 4.9 of the report and attached to this appendix.

TOPSOIL ANALYTICAL TESTS

Topsoil analytical testing was performed on 3 samples of the near-surface soils from the project site by Sunland Analytical of Rancho Cordova, California. The topsoil was tested for percentages of organic matter, percentages of macro and micro nutrients, deleterious material, pH, mineral content, and herbicide presence. The test results are attached to this appendix.

WATER QUALITY TESTS

Water quality testing was performed by the local water supply agency, Placer County Water Agency, on potable water samples collected within the area surrounding the project site. The public document provided by Placer County Water Agency is attached to this appendix.

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Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-1	0.0 - 2.5	1	CLAYEY SAND (SC)					29	26	17	9	
B-1	5.5 - 6.5	2c	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	9.8								
B-2	3.5 - 4.0	1a	POORLY GRADED SAND WITH CLAY (SP-SC)	7.1	133.1							
B-3	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT (SP-SM)	17.6	107.2							
B-4	0.0 - 2.5	1	CLAYEY SAND (SC)					28				
B-4	3.0 - 4.0	1c	POORLY GRADED SND WITH SILT (SP-SM)	13.2								
B-5	6.0 - 6.5	2a	POORLY GRADED SAND WITH CLAY (SP-SC)	9.1								
B-6	3.5 - 4.0	1a	POORLY GRADED SAND WITH CLAY (SP-SC)	13.9	112.8							
B-7	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	8.3								
B-8	0.0 - 2.5	1	SILTY SAND (SM)					29	NP	NP	NP	
B-8	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT (SP-SM)	9.2	125.3							
B-9	3.0 - 4.0	1c	SILTY SAND (SM)	16.6	108.9							
B-9	3.5 - 4.0	1b	SILTY SAND (SM)					25				
B-10	3.5 - 4.0	1a	POOTLY GRADED SAND WITH CLAY (SP-SC0	11.8								
B-11	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	12.6	115.0							
B-13	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT (SP-SM)	14.3	113.9							
B-14	0.0 - 2.5	1	CLAYEY SAND (SC)					24				
B-14	3.5 - 4.0	1a	POORLY GRADED SAND WITH CLAY (SP-SC)	11.8	121.9							
B-15	0.0 - 2.5	1	SILTY CLAYEY SAND (SC-SM)					31	25	18	7	
B-15	3.5 - 4.0	1a	POORLY GRADED SAND WITH CLAY (SP-SC)	7.8	119.2							
B-16	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT (SP-SM)	14.0	114.5							
B-17	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT (SP-SM)	9.3								
B-18	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT (SP-SM)	14.9								
B-20	3.0 - 4.0	1c	SILTY SAND (SM)	10.5	119.2							
B-20	3.5 - 4.0	1b	SILTY SAND (SM)					18				
B-21	5.5 - 6.5	2c	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)	9.9								
B-22	3.5 - 4.0	1b	SILTY SAND (SM)					23				
B-22	5.5 - 6.5	2c	SILTY SAND (SM)	12.6	115.5							

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

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DATE: 1/18/2017
REVISED: 3/21/2017

LABORATORY TEST RESULT SUMMARY

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
B-1

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-23	3.5 - 4.0	1b	POORLY GRADED SAND WITH SILT (SP-SM)	10.1	119.1			17				
B-23	5.5 - 6.5	2c	SILTY SAND (SM)	7.0	126.1							
B-24	0.0 - 2.0	1	CLAYEY SAND (SC)									**R-Value=** 10
B-24	3.0 - 4.0	1c	SILTY SAND (SM)	15.0								
B-25	3.0 - 4.0	1c	POORLY GRADED SAND WITH SILT 9SP-SM)	11.0	118.3							
B-27	0.0 - 5.0	1	CLAYEY SAND (SC)					35	27	18	9	**R-Value=** 26
B-28	0.0 - 5.0	1	SILTY SAND (SM)					30	NP	NP	NP	**R-Value=** 17
B-33	0.0 - 5.0	1	SILTY SAND (SM)					29	NP	NP	NP	**R-Value=** 18
B-34	0.0 - 5.0	1	SILTY SAND (SM)					30	NP	NP	NP	**R-Value=** 30

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

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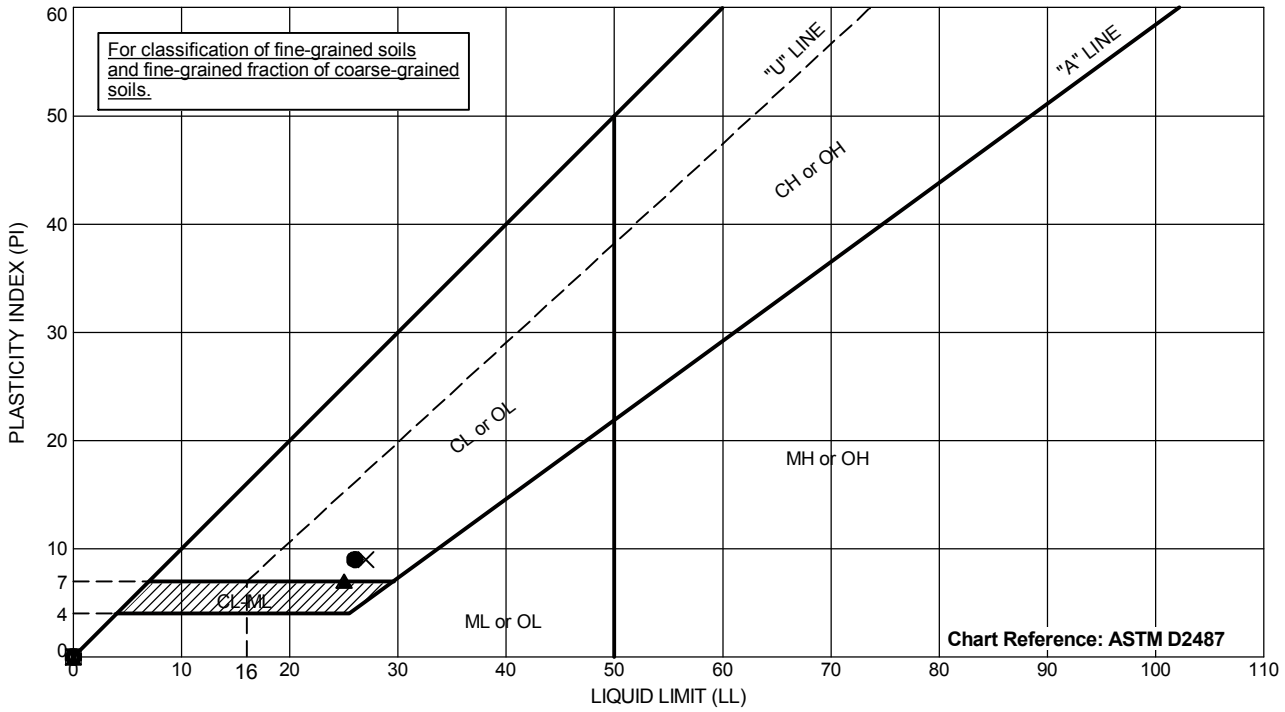
REVISED: 3/21/2017

LABORATORY TEST RESULT SUMMARY

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE
B-2



	Exploration ID	Depth (ft.)	Sample Number	Sample Description	Passing #200	LL	PL	PI
●	B-1	0 - 2.5	1	CLAYEY SAND (SC)	29	26	17	9
⧗	B-8	0 - 2.5	1	SILTY SAND (SM)	29	NP	NP	NP
▲	B-15	0 - 2.5	1	SILTY CLAYEY SAND (SC-SM)	31	25	18	7
×	B-27	0 - 5	1	CLAYEY SAND (SC)	35	27	18	9
⦿	B-28	0 - 5	1	SILTY SAND (SM)	30	NP	NP	NP
✿	B-33	0 - 5	1	SILTY SAND (SM)	29	NP	NP	NP
○	B-34	0 - 5	1	SILTY SAND (SM)	30	NP	NP	NP

Testing perfomed in general accordance with ASTM D4318.
NP = Nonplastic
NA = Not Available
NM = Not Measured

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

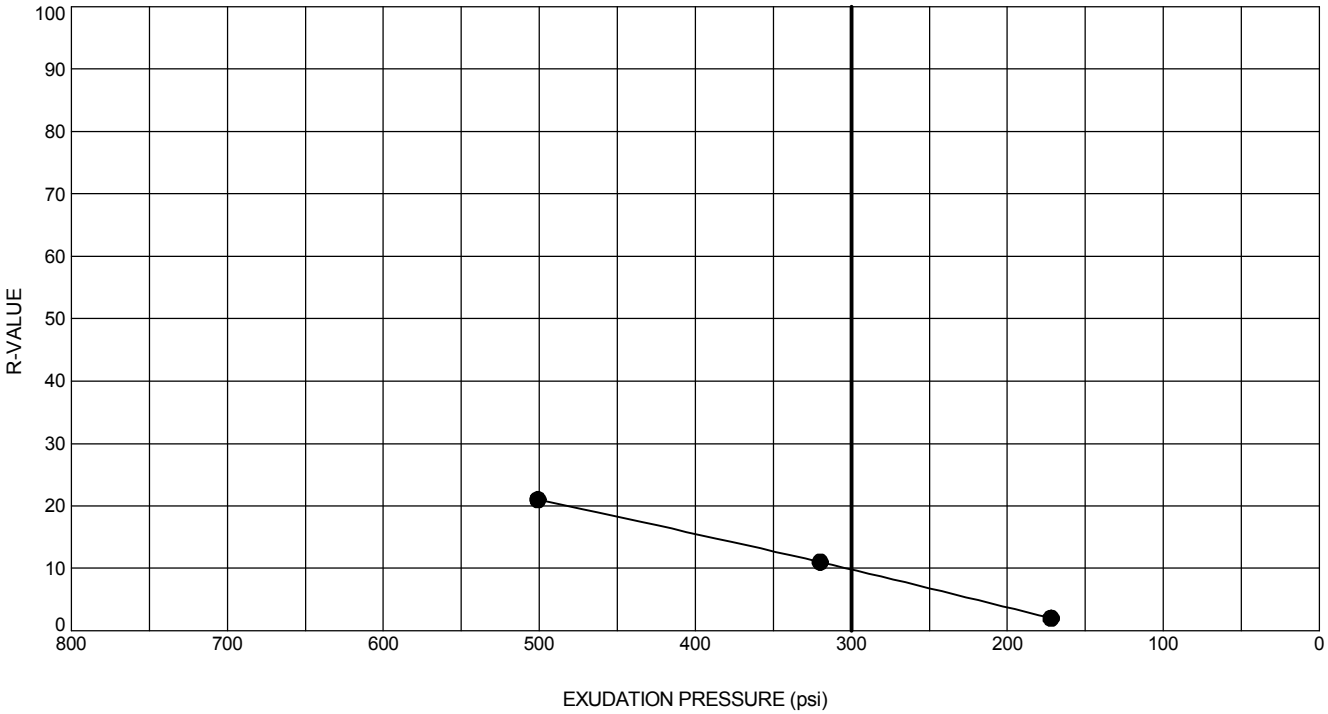
ATTERBERG LIMITS

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

B-3

PLOTTED: 03/21/2017 09:47 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_ATTERBERG (ASTM)]



Exploration ID	Depth (ft.)	Sample Number	Sample Description	R-Value @ 300 psi Exudation Pressure
B-24	0 - 2	1	CLAYEY SAND (SC)	10

Specimen No.	Moisture at Time of Test (%)	Dry Unit Weight (pcf)	Expansion Pressure (psi)	Exudation Pressure (psi)	Corrected Resistance Value
1	10.3	129.9	160	501	21
2	12.1	122.9	30	320	11
3	13.9	114.7	0	172	2

Testing perfomed in general accordance with ASTM D2844.
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

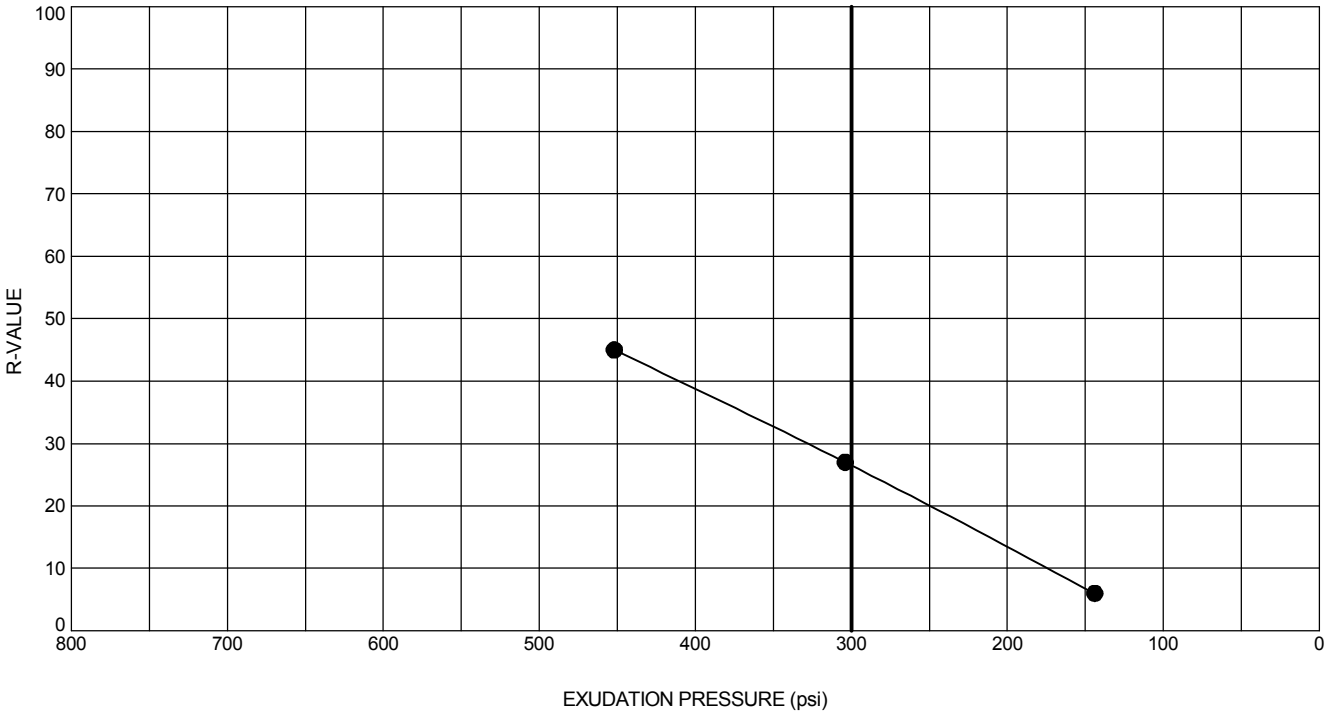
R-VALUE

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

B-4

PLOTTED: 03/21/2017 09:47 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_R-VALUE (REVERSED)]



Exploration ID	Depth (ft.)	Sample Number	Sample Description	R-Value @ 300 psi Exudation Pressure
B-27	0 - 5	1	CLAYEY SAND (SC)	26

Specimen No.	Moisture at Time of Test (%)	Dry Unit Weight (pcf)	Expansion Pressure (psi)	Exudation Pressure (psi)	Corrected Resistance Value
1	10.8	127.0	178	452	45
2	11.7	125.3	156	304	27
3	12.6	121.8	35	144	6

Testing perfomed in general accordance with ASTM D2844.
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

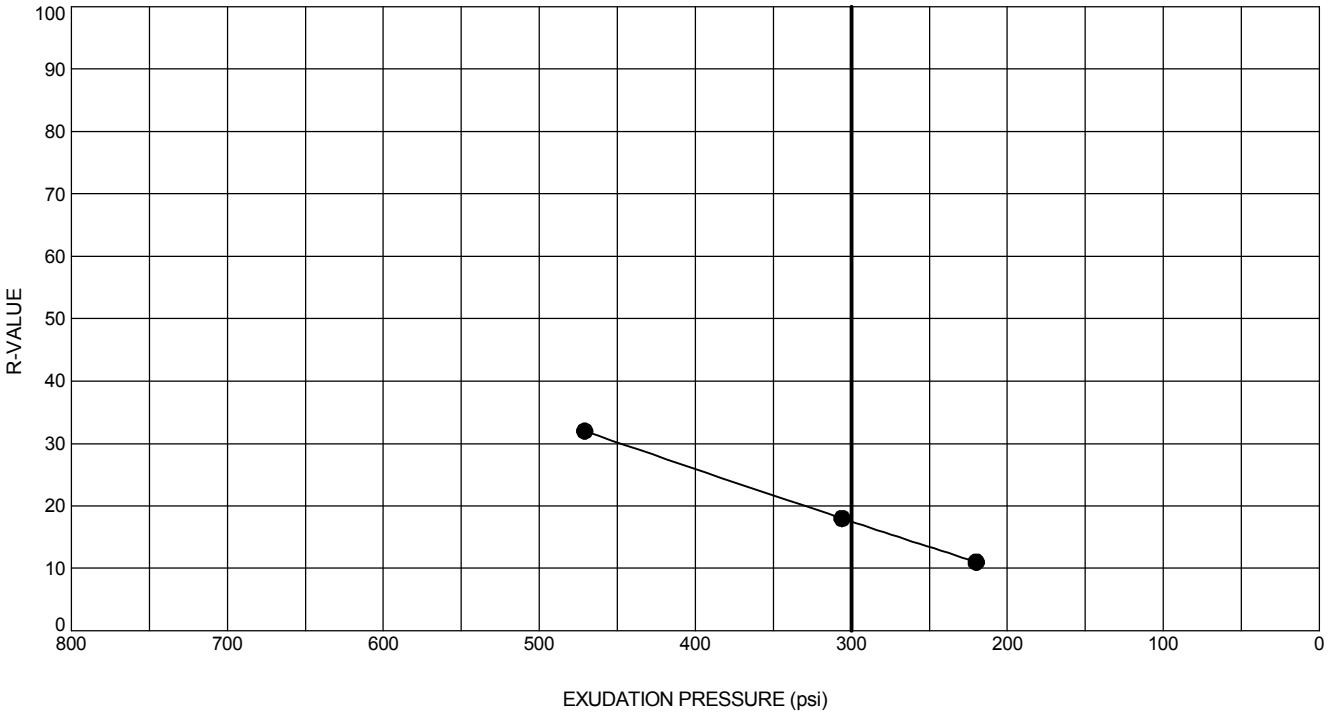
R-VALUE

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

B-5

PLOTTED: 03/21/2017 09:47 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_R-VALUE (REVERSED)]



Exploration ID	Depth (ft.)	Sample Number	Sample Description	R-Value @ 300 psi Exudation Pressure
B-28	0 - 5	1	SILTY SAND (SM)	17

Specimen No.	Moisture at Time of Test (%)	Dry Unit Weight (pcf)	Expansion Pressure (psi)	Exudation Pressure (psi)	Corrected Resistance Value
1	9.2	127.8	22	471	32
2	10.1	125.3	0	306	18
3	10.9	124.7	0	220	11

Testing perfomed in general accordance with ASTM D2844.
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

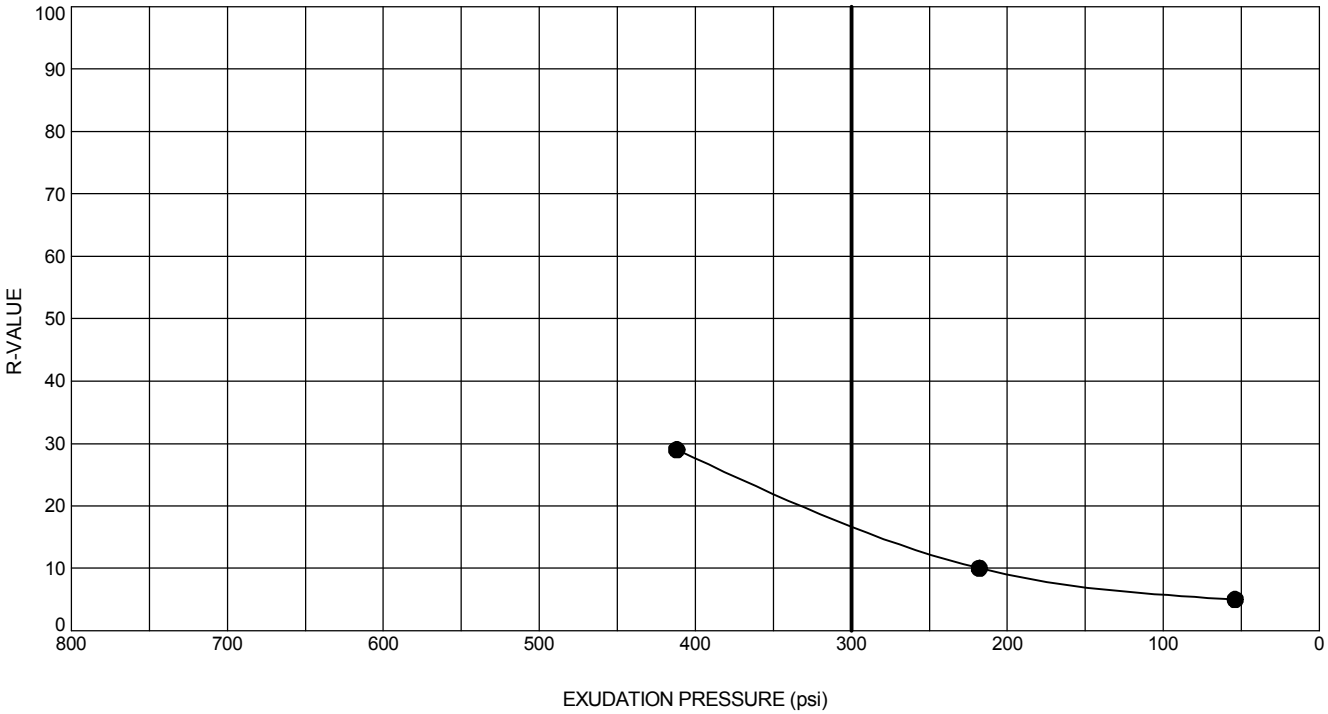
R-VALUE

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

B-6

PLOTTED: 03/21/2017 09:47 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_R-VALUE (REVERSED)]



Exploration ID	Depth (ft.)	Sample Number	Sample Description	R-Value @ 300 psi Exudation Pressure
B-33	0 - 5	1	SILTY SAND (SM)	18

Specimen No.	Moisture at Time of Test (%)	Dry Unit Weight (pcf)	Expansion Pressure (psi)	Exudation Pressure (psi)	Corrected Resistance Value
1	11.9	119.1	0	412	29
2	13.3	121.7	0	218	10
3	14.7	117.8	0	54	5

Testing perfomed in general accordance with ASTM D2844.
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

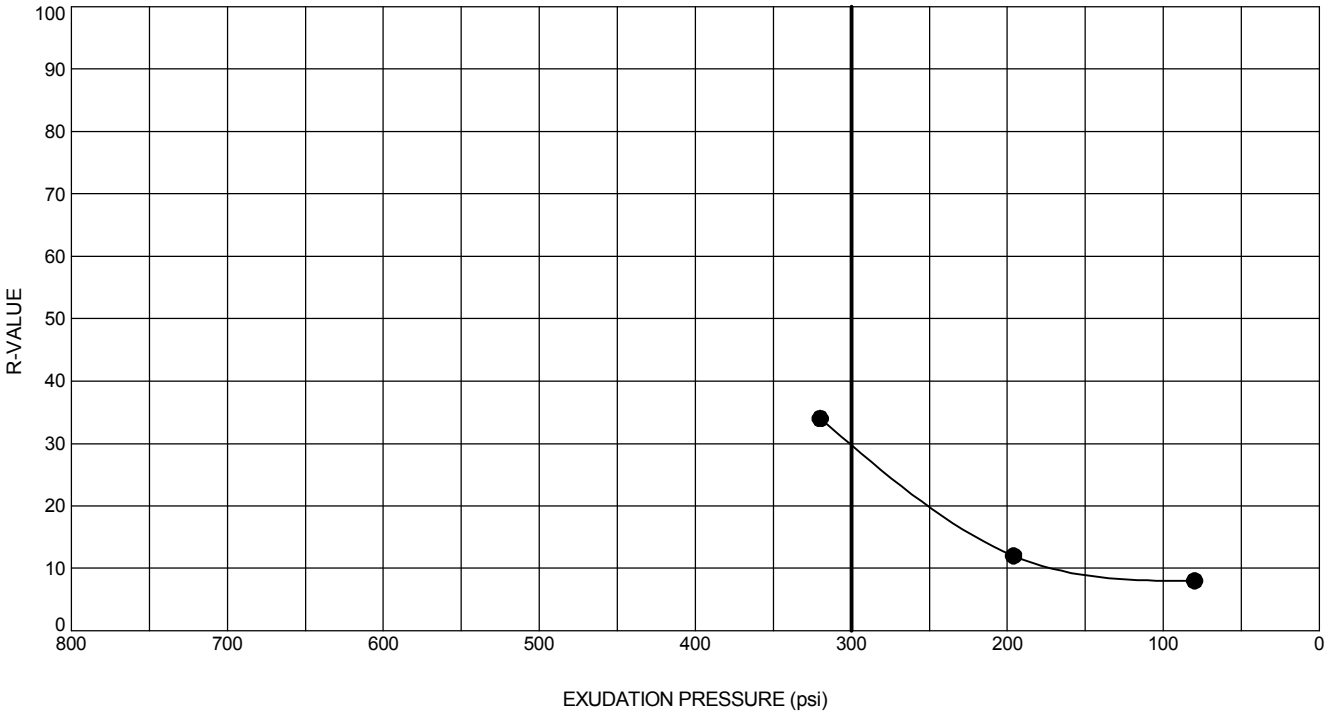
R-VALUE

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

B-7

PLOTTED: 03/21/2017 09:47 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_R-VALUE (REVERSED)]



Exploration ID	Depth (ft.)	Sample Number	Sample Description	R-Value @ 300 psi Exudation Pressure
B-34	0 - 5	1	SILTY SAND (SM)	30

Specimen No.	Moisture at Time of Test (%)	Dry Unit Weight (pcf)	Expansion Pressure (psi)	Exudation Pressure (psi)	Corrected Resistance Value
1	11.7	123.3	0	320	34
2	12.6	122.3	0	196	12
3	13.5	120.0	0	80	8

Testing perfomed in general accordance with ASTM D2844.
NA = Not Available

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.:	20173273
DRAWN BY:	DR
CHECKED BY:	BM
DATE:	1/18/2017
REVISED:	3/21/2017

R-VALUE

Proposed Costco Wholesale Warehouse
Sierra College Boulevard and Brace Road
Loomis, California
CW# 16-0132

FIGURE

B-8

PLOTTED: 03/21/2017 09:47 AM BY: DRoss
PROJECT NUMBER: 20173273.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_R-VALUE (REVERSED)]

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 01/25/2017
Date Submitted 01/20/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 20173273.001A Site ID : TP-4 @ 0-2FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73533-153394.

EVALUATION FOR SOIL CORROSION

Soil pH	5.71
Moisture	10.1 %
Minimum Resistivity	No Test
Chloride	No Test
Sulfate	No Test
Redox Potential	(+) 377 mv
Sulfides	Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422
Redox Potential ASTM G-200, Sulfides AWWA C105/A25.5

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 01/25/2017
Date Submitted 01/20/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 20173273.001A Site ID : TP-5 @ 0-1 FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73533-153395.

EVALUATION FOR SOIL CORROSION

Soil pH	5.61
Moisture	11.3 %
Minimum Resistivity	No Test
Chloride	No Test
Sulfate	No Test
Redox Potential	(+) 331 mv
Sulfides	Presence - NEGATIVE

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422
Redox Potential ASTM G-200, Sulfides AWWA C105/A25.5

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 01/27/2017
Date Submitted 01/23/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 20173273.001A Site ID : B-5 1A-1B@3-4FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73535-153397.

EVALUATION FOR SOIL CORROSION

Soil pH	5.16	
Moisture	11.3 %	
Minimum Resistivity	13.40 ohm-cm (x1000)	
Chloride	6.5 ppm	00.00065 %
Sulfate	2.2 ppm	00.00022 %
Redox Potential	(+) 323 mv	
Sulfides	Presence - NEGATIVE	

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422
Redox Potential ASTM G-200, Sulfides AWWA C105/A25.5

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 01/27/2017
Date Submitted 01/23/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 20173273.001A Site ID : B-17 1A-1B@3-4.
Thank you for your business.

* For future reference to this analysis please use SUN # 73535-153398.

EVALUATION FOR SOIL CORROSION

Soil pH	5.35	
Moisture	9.0 %	
Minimum Resistivity	20.64 ohm-cm (x1000)	
Chloride	6.1 ppm	00.00061 %
Sulfate	1.5 ppm	00.00015 %
Redox Potential	(+) 309 mv	
Sulfides	Presence - NEGATIVE	

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422
Redox Potential ASTM G-200, Sulfides AWWA C105/A25.5

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017
Date Collected 02/27/2017
ELAP CERT # 2014

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B29@0-2.5F.
Your purchase order number is .
Thank you for your business.

* For future reference to this analysis please use SUN # 73697-153713.

ANALYSIS OF SOIL FOR 503 REGULATED METALS

Percent Moisture 3.5

* Sample analyzed as recieved and reported on a dry weight basis.

Regulated Limits ++		Values Determined +			Detection Limits
41	Arsenic (As)	1.912 mg/kg	******		0.011
39	Cadmium (Cd)	ND	*		0.04
1200	Chromium (Cr)	27.8 mg/kg	******		0.12
N.E.	Cobalt (Co)	No Test			0.07
1500	Copper (Cu)	8.2 mg/kg	******		0.06
300	Lead (Pb)	ND	*		0.06
17	Mercury (Hg)	0.05 mg/kg	******		0.01
N.E.	Molybdenum (Mo)	No Test			0.08
420	Nickel (Ni)	14.0 mg/kg	******		0.02
36	Selenium (Se)	14.348 mg/kg	*******		0.014
2800	Zinc (Zn)	30.4 mg/kg	******		0.02
			ND	Below Limits	At Toxic Level

ND = value below detection limits
N.E. = value not established by regulatory agencies
Element/Methods Digest.Method 3050 A or B
EPA SW-846 ICP 6010 and EPA SW-846 7470A or 7470B

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Completed 03/03/2017
Date Submitted 02/28/2017
Date Collected 02/27/2017
ELAP Cert. #2014

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B29@0-2.5F.
Your purchase order number is . Thank you for your business.

* For future reference to this analysis please use SUN # 73697-153713.

ANALYSIS OF SOIL

TYPE OF TEST	RESULTS	UNITS
Silver (Ag)	ND	mg/kg
Vanadium (V)	42.187	mg/kg

DETECTION LIMITS

Silver (Ag)	0.03
Vanadium (V)	0.09

Digestion Method 3050 A/B, EPA SW 846 ICP 6010
ND = Below Detection Limits

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017
Date Collected 02/27/2017
ELAP CERT # 2014

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B31@0-3FT.
Your purchase order number is .
Thank you for your business.

* For future reference to this analysis please use SUN # 73697-153714.

ANALYSIS OF SOIL FOR 503 REGULATED METALS

Percent Moisture 11.8

* Sample analyzed as recieved and reported on a dry weight basis.

Regulated Limits ++		Values Determined +			Detection Limits
41	Arsenic (As)	1.347 mg/kg	******		0.011
39	Cadmium (Cd)	ND	*		0.04
1200	Chromium (Cr)	11.1 mg/kg	******		0.12
N.E.	Cobalt (Co)	No Test			0.07
1500	Copper (Cu)	4.5 mg/kg	******		0.06
300	Lead (Pb)	ND	*		0.06
17	Mercury (Hg)	0.12 mg/kg	******		0.01
N.E.	Molybdenum (Mo)	No Test			0.08
420	Nickel (Ni)	6.2 mg/kg	******		0.02
36	Selenium (Se)	1.553 mg/kg	******		0.014
2800	Zinc (Zn)	12.5 mg/kg	******		0.02
			ND	Below Limits	At Toxic Level

ND = value below detection limits
N.E. = value not established by regulatory agencies
Element/Methods Digest.Method 3050 A or B
EPA SW-846 ICP 6010 and EPA SW-846 7470A or 7470B

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Completed 03/03/2017
Date Submitted 02/28/2017
Date Collected 02/27/2017
ELAP Cert. #2014

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B31@0-3FT.
Your purchase order number is . Thank you for your business.

* For future reference to this analysis please use SUN # 73697-153714.

ANALYSIS OF SOIL

TYPE OF TEST	RESULTS	UNITS
Silver (Ag)	ND	mg/kg
Vanadium (V)	23.774	mg/kg

DETECTION LIMITS

Silver (Ag)	0.03
Vanadium (V)	0.09

Digestion Method 3050 A/B, EPA SW 846 ICP 6010
ND = Below Detection Limits

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017
Date Collected 02/27/2017
ELAP CERT # 2014

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B37@0-2.5F.
Your purchase order number is .
Thank you for your business.

* For future reference to this analysis please use SUN # 73697-153715.

ANALYSIS OF SOIL FOR 503 REGULATED METALS

Percent Moisture 3.8

* Sample analyzed as recieved and reported on a dry weight basis.

Regulated Limits ++		Values Determined +		ND	Below Limits	At Toxic Level	Detection Limits
41	Arsenic (As)	3.049	mg/kg	******			0.011
39	Cadmium (Cd)	ND		*			0.04
1200	Chromium (Cr)	22.5	mg/kg	******			0.12
N.E.	Cobalt (Co)	No Test					0.07
1500	Copper (Cu)	9.0	mg/kg	******			0.06
300	Lead (Pb)	ND		*			0.06
17	Mercury (Hg)	0.12	mg/kg	******			0.01
N.E.	Molybdenum (Mo)	No Test					0.08
420	Nickel (Ni)	14.3	mg/kg	******			0.02
36	Selenium (Se)	3.324	mg/kg	******			0.014
2800	Zinc (Zn)	39.0	mg/kg	******			0.02

ND = value below detection limits
N.E. = value not established by regulatory agencies
Element/Methods Digest.Method 3050 A or B
EPA SW-846 ICP 6010 and EPA SW-846 7470A or 7470B

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Completed 03/03/2017
Date Submitted 02/28/2017
Date Collected 02/27/2017
ELAP Cert. #2014

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B37@0-2.5F.
Your purchase order number is . Thank you for your business.

* For future reference to this analysis please use SUN # 73697-153715.

ANALYSIS OF SOIL

TYPE OF TEST	RESULTS	UNITS
Silver (Ag)	ND	mg/kg
Vanadium (V)	40.576	mg/kg

DETECTION LIMITS

Silver (Ag)	0.03
Vanadium (V)	0.09

Digestion Method 3050 A/B, EPA SW 846 ICP 6010
ND = Below Detection Limits

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

03/03/2017

LABORATORY CONTROL REPORT
Metal Analysis and Preparation for Sun Nos. 153713,153714,153715.
Method of Sample Preparation:

Analyte	Conc. of Analyte	Accuracy %	Precision (+/- RPD)
Arsenic	5.000	104	4
Cadmium	5.000	100	<1
Chromium	5.000	101	1
Copper	2.500	105	2
Lead	5.000	96	2
Mercury	0.050	100	<1
Nickel	5.000	97	4
Selenium	5.000	93	2
Silver	1.000	104	<1
Vanadium	2.500	101	1
Zinc	5.000	98	<1

NOTES (All of the following are specific for the current analysis process.)

1. Analyte concentration is obtained from purchased Quality Control Standards
2. Accuracy is the percent of the known analyte concentration determined and should fall within the range of 85 - 115%.
3. Precision is the relative percent difference of two determinations (D1 & D2) of the know analyte. RPD= ((D1-D2)/(D1+D2)/2) * 100

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B-29@0-2.5FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73699-153717.

SOIL ANALYSIS

Saturation Percent (SP)	39		Soil Texture Loam
pH	5.96		
E.C.	0.06	mmho/cm	
Tot.Dissolved Salts	38.4	ppm	
Infiltration Rate (0% Slope)	0.54	in/hr	
% Organic Matter	2.6		
C.E.C.	13.0	meq/100g	
Sodium Absorption Ratio (SAR)	1.6		
Exchangable Sodium Percent (ESP)	1.1		
Gypsum Req. ($CaSO_4*2H_2O$)	None Required		
est. Nitrogen Release	1.2	#/1000 sq.ft.	

Nitrate	0.41	ppm	*
Phosphorus	3.78	ppm	***
Potassium	71.17	ppm	**********
Sulfur	2.92	ppm	****
Chloride	10.48	ppm	********
Carbonates	13.12	ppm	**********
Sodium	34.24	ppm	
Calcium	2075.52	ppm	**********
Magnesium	284.55	ppm	**********
Boron	0.15	ppm	****
Copper	0.41	ppm	***
Iron	16.15	ppm	**********
Manganese	5.31	ppm	**********
Zinc	0.35	ppm	*********

Very Low | Low | Adequate | Excessive

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

DATE 03/03/2017
SUN NUMBER 153717

Information requested by:
Becky Money
Kleinfelder Group

Information for:
20173273.001A
Sample ID: B-29@0-2.5FT

SOIL RECOMMENDATIONS FOR LANDSCAPE GARDENING

SOIL pH (Acidity and Alkalinity)

The pH of this sample indicates the soil is moderately acid and should be modified for non acid-tolerant plants. Apply 28 pounds of Dolomite Lime per 1000 sq.ft. and work into ground before planting.

DISSOLVED SALTS (Indicated by E.C. & TDS)

These conditions are in the normal range for plant growth.

SOIL TEXTURE AND RATE OF WATER INFILTRATION

The infiltration rate for all soil textures decreases with increasing ground slope. At 0 to 4%, 5 to 8%, 9 to 12%, 13 to 16% and above 16% the infiltration rate of this sample decreases from 0.54 to 0.43, 0.32, 0.22, 0.14, respectively. Infiltration rate also decreases with percent of ground cover and by compaction.

WATER PENETRATION OF SOIL DUE TO CHEMICAL CHARACTERISTICS

When exchangable Sodium increases in the soil, water penetration decreases. Based on SAR and ESP values this sample has no penetration problem due to soil Sodium. No Gypsum required.

ORGANIC MATTER

Organic matter provides a slow nitrogen release and aids water retention. This sample has a moderate Organic Matter content.
To maintain moisture and provide sustained nitrogen release a level of 10% organic matter is recommended. Use amending material that is approximately 75% organic matter (i.e. many ground fir barks). Based on the analysis of this soil sample apply 4 yards per 1000 sq.ft. Spread evenly and blend into the top six inches of soil. It is a reasonable practice to apply a top dressing of 3 inches of organic mulches to aid water penetration and retention.

SOIL BORON

Boron concenrations are in a range allowing normal plant growth.

SOIL MICRONUTRIENTS

Micronutrients, Copper, Iron, Manganese and Zinc, in soil are present in small amounts. However, they play a necessary role in plant metabolism. Without appropriate amounts plants will not thrive. Apply the following per 1000/ sq.ft. Do not mix micronutrients during application (use a separate application for each element indicated).

Because copper, manganese and zinc are in very small amounts, dissolve (each) in 2 gallons of water and use a sprayer to obtain an even application.
Apply 0.2 # Copper Sulfate, 0.5 # Zinc Sulfate and water.

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

DATE 03/03/2017
SUN NUMBER 153717

Information requested by:
Becky Money
Kleinfelder Group

Information for:
20173273.001A
Sample ID: B-29@0-2.5FT

SOIL RECOMMENDATIONS FOR LANDSCAPE GARDENING

SOIL MACRONUTRIENTS : NITROGEN-PHOSPHORUS-POTASSIUM (N-P-K)
GENERAL N-P-K RECOMMENDATION

Use ONE of these NPK preparations for the first fertilizer application.

Standard NPK Fertilizer Preparations	6-20-20	5-20-10	16-16-16	0-10-10	28-3-4	21-0-0	Customer Choice None
#/1000 sq.ft.	21	25	N/A	N/A	N/A	N/A	**

GRASS OR SOD PREPARATION

Till in organic matter, N,P,K and micro nutrients in addition to any lime gypsum or sulfur as directed above. Smooth soil surface and follow seed or sod producers direction for moisture and product application.

TREES AND SHRUBS

Excavate holes for planting shrubs and trees to at least twice the volume of the container. Prepare backfill for tree and shrub planting holes by mixing three parts of native soil (or imported top soil) with one part organic amendment (preferably nitrogen and iron fortified) and 2.5 pounds of 6-20-20 per yard of mix. For extended fertilization, place slow release fertilizer tablets in each hole per manufacturer's instructions. If 6-20-20 was not directly added to backfill mix, during backfill apply uniformly 1/2 oz of 6-20-20 per gallon containers, 2.5 oz per 5 gallons, 6 oz per 24 inch boxes.

Summary and Suggested Sequence of Soil Improvements (#/1000 Sq.Ft.)

Dolimite Lime	28	#	
Organic Amendment	4	Yd./1000 Sq.Ft.	Bulk organic amendment (nitrofied).
N-P-K Fertilizer	See above chart		
Micro Nutrients			
Copper	0.2	#	Copper sulfate
Zinc	0.5	#	Zinc Sulfate
Sulfate-Sulfur	1	#	Ammonium Sulfate

Maintenance Fertilization

Apply 5 pounds of Ammonium sulfate (21-0-0) per 1000 sq.ft.every month until plants become established. After established, apply 28-3-4 (or similar preparation) to provide desired growth rate and color.

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B-29@0-2.5FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73699-153717.

SOIL ANALYSIS

TYPE OF TEST	RESULTS	UNITS
Aluminum (Al)	9.24	ppm
Molybdenum (Mo)	0.216	ppm

Ammonium Bicarbonate/DTPA Extraction

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B-31@0-3FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73699-153718.

SOIL ANALYSIS

Saturation Percent (SP)	23		Soil Texture Sandy Loam
pH	6.40		
E.C.	0.15	mmho/cm	
Tot.Dissolved Salts	96	ppm	
Infiltration Rate (0% Slope)	0.75	in/hr	
% Organic Matter	1.5		
C.E.C.	5.8	meq/100g	
Sodium Absorption Ratio (SAR)	1.8		
Exchangable Sodium Percent (ESP)	1.4		
Gypsum Req. ($CaSO_4*2H_2O$)	None Required		
est. Nitrogen Release	1.0	#/1000 sq.ft.	

Nitrate	0.04	ppm	*
Phosphorus	14.10	ppm	**********
Potassium	49.47	ppm	*******
Sulfur	0.68	ppm	*
Chloride	16.35	ppm	**********
Carbonates	59.36	ppm	**********
Sodium	17.94	ppm	
Calcium	868.32	ppm	**********
Magnesium	147.94	ppm	*******
Boron	0.17	ppm	*****
Copper	1.01	ppm	*********
Iron	127.02	ppm	**********
Manganese	87.53	ppm	**********
Zinc	1.19	ppm	**********

Very Low | Low | Adequate | Excessive

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

DATE 03/03/2017
SUN NUMBER 153718

Information requested by:
Becky Money
Kleinfelder Group

Information for:
20173273.001A
Sample ID: B-31@0-3FT

SOIL RECOMMENDATIONS FOR LANDSCAPE GARDENING

SOIL pH (Acidity and Alkalinity)

The pH of this sample indicates the soil is moderately acid and should be modified for non acid-tolerant plants. Apply 10 pounds of Dolomite Lime per 1000 sq.ft. and work into ground before planting.

DISSOLVED SALTS (Indicated by E.C. & TDS)

These conditions are in the normal range for plant growth.

SOIL TEXTURE AND RATE OF WATER INFILTRATION

The infiltration rate for all soil textures decreases with increasing ground slope. At 0 to 4%, 5 to 8%, 9 to 12%, 13 to 16% and above 16% the infiltration rate of this sample decreases from 1.06 to 0.85, 0.64, 0.42, 0.27, respectively. Infiltration rate also decreases with percent of ground cover and by compaction.

WATER PENETRATION OF SOIL DUE TO CHEMICAL CHARACTERISTICS

When exchangable Sodium increases in the soil, water penetration decreases. Based on SAR and ESP values this sample has no penetration problem due to soil Sodium. No Gypsum required.

ORGANIC MATTER

Organic matter provides a slow nitrogen release and aids water retention. This sample has a low Organic Matter content.
To maintain moisture and provide sustained nitrogen release a level of 10% organic matter is recommended. Use amending material that is approximately 75% organic matter (i.e. many ground fir barks). Based on the analysis of this soil sample apply 4 yards per 1000 sq.ft. Spread evenly and blend into the top six inches of soil. It is a reasonable practice to apply a top dressing of 3 inches of organic mulches to aid water penetration and retention.

SOIL BORON

Boron concenrations are in a range allowing normal plant growth.

SOIL MICRONUTRIENTS

Micronutrients, Copper, Iron, Manganese and Zinc, in soil are present in small amounts. However, they play a necessary role in plant metabolism. Without appropriate amounts plants will not thrive. Soil has adequate amounts - no application needed.

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

DATE 03/03/2017
SUN NUMBER 153718

Information requested by:
Becky Money
Kleinfelder Group

Information for:
20173273.001A
Sample ID: B-31@0-3FT

SOIL RECOMMENDATIONS FOR LANDSCAPE GARDENING

SOIL MACRONUTRIENTS : NITROGEN-PHOSPHORUS-POTASSIUM (N-P-K)
GENERAL N-P-K RECOMMENDATION

Use ONE of these NPK preparations for the first fertilizer application.

Standard NPK Fertilizer Preparations	6-20-20	5-20-10	16-16-16	0-10-10	28-3-4	21-0-0	Customer Choice None
#/1000 sq.ft.	21	25	N/A	N/A	N/A	N/A	**

GRASS OR SOD PREPARATION

Till in organic matter, N,P,K and micro nutrients in addition to any lime gypsum or sulfur as directed above. Smooth soil surface and follow seed or sod producers direction for moisture and product application.

TREES AND SHRUBS

Excavate holes for planting shrubs and trees to at least twice the volume of the container. Prepare backfill for tree and shrub planting holes by mixing three parts of native soil (or imported top soil) with one part organic amendment (preferably nitrogen and iron fortified) and 2.5 pounds of 6-20-20 per yard of mix. For extended fertilization, place slow release fertilizer tablets in each hole per manufacturer's instructions. If 6-20-20 was not directly added to backfill mix, during backfill apply uniformly 1/2 oz of 6-20-20 per gallon containers, 2.5 oz per 5 gallons, 6 oz per 24 inch boxes.

Summary and Suggested Sequence of Soil Improvements (#/1000 Sq.Ft.)

Dolimite Lime	10	#
Organic Amendment	4	Yd./1000 Sq.Ft. Bulk organic amendment (nitrofied).
N-P-K Fertilizer	See above chart	
Magnesium	Low Magnesium compensated for by Dolimite Lime	
Sulfate-Sulfur	1	# Ammonium Sulfate

Maintenance Fertilization

Apply 5 pounds of Ammonium sulfate (21-0-0) per 1000 sq.ft.every month until plants become established. After established, apply 28-3-4 (or similar preparation) to provide desired growth rate and color.

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B-31@0-3FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73699-153718.

SOIL ANALYSIS

TYPE OF TEST	RESULTS	UNITS
Aluminum (Al)	6.63	ppm
Molybdenum (Mo)	0.054	ppm

Ammonium Bicarbonate/DTPA Extraction

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B-37@0-2.5FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73699-153719.

SOIL ANALYSIS

Saturation Percent (SP)	37		Soil Texture Loam
pH	6.51		
E.C.	0.08	mmho/cm	
Tot.Dissolved Salts	51.2	ppm	
Infiltration Rate (0% Slope)	0.54	in/hr	
% Organic Matter	2.2		
C.E.C.	8.7	meq/100g	
Sodium Absorption Ratio (SAR)	2.0		
Exchangable Sodium Percent (ESP)	1.7		
Gypsum Req. ($CaSO_4*2H_2O$)	None Required		
est. Nitrogen Release	1.1	#/1000 sq.ft.	

Nitrate	0.55	ppm	*
Phosphorus	5.04	ppm	*****
Potassium	63.68	ppm	**********
Sulfur	2.12	ppm	***
Chloride	9.32	ppm	********
Carbonates	27.85	ppm	**********
Sodium	33.16	ppm	
Calcium	1308.68	ppm	**********
Magnesium	226.23	ppm	*********
Boron	0.15	ppm	****
Copper	0.41	ppm	***
Iron	13.83	ppm	**********
Manganese	5.13	ppm	**********
Zinc	0.32	ppm	********

Very Low | Low | Adequate | Excessive

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

DATE 03/03/2017
SUN NUMBER 153719

Information requested by:
Becky Money
Kleinfelder Group

Information for:
20173273.001A
Sample ID: B-37@0-2.5FT

SOIL RECOMMENDATIONS FOR LANDSCAPE GARDENING

SOIL pH (Acidity and Alkalinity)

The pH of this sample indicates the soil is in a range for normal growth of most plants. No modification is required.

DISSOLVED SALTS (Indicated by E.C. & TDS)

These conditions are in the normal range for plant growth.

SOIL TEXTURE AND RATE OF WATER INFILTRATION

The infiltration rate for all soil textures decreases with increasing ground slope. At 0 to 4%, 5 to 8%, 9 to 12%, 13 to 16% and above 16% the infiltration rate of this sample decreases from 0.54 to 0.43, 0.32, 0.22, 0.14, respectively. Infiltration rate also decreases with percent of ground cover and by compaction.

WATER PENETRATION OF SOIL DUE TO CHEMICAL CHARACTERISTICS

When exchangable Sodium increases in the soil, water penetration decreases. Based on SAR and ESP values this sample has no penetration problem due to soil Sodium. No Gypsum required.

ORGANIC MATTER

Organic matter provides a slow nitrogen release and aids water retention. This sample has a moderate Organic Matter content.
To maintain moisture and provide sustained nitrogen release a level of 10% organic matter is recommended. Use amending material that is approximately 75% organic matter (i.e. many ground fir barks). Based on the analysis of this soil sample apply 4 yards per 1000 sq.ft. Spread evenly and blend into the top six inches of soil. It is a reasonable practice to apply a top dressing of 3 inches of organic mulches to aid water penetration and retention.

SOIL BORON

Boron concenrations are in a range allowing normal plant growth.

SOIL MICRONUTRIENTS

Micronutrients, Copper, Iron, Manganese and Zinc, in soil are present in small amounts. However, they play a necessary role in plant metabolism. Without appropriate amounts plants will not thrive. Apply the following per 1000/ sq.ft. Do not mix micronutrients during application (use a separate application for each element indicated).

Because copper, manganese and zinc are in very small amounts, dissolve (each) in 2 gallons of water and use a sprayer to obtain an even application.
Apply 0.2 # Copper Sulfate, 0.5 # Zinc Sulfate and water.

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

DATE 03/03/2017
SUN NUMBER 153719

Information requested by:
Becky Money
Kleinfelder Group

Information for:
20173273.001A
Sample ID: B-37@0-2.5FT

SOIL RECOMMENDATIONS FOR LANDSCAPE GARDENING

SOIL MACRONUTRIENTS : NITROGEN-PHOSPHORUS-POTASSIUM (N-P-K)
GENERAL N-P-K RECOMMENDATION

Use ONE of these NPK preparations for the first fertilizer application.

Standard NPK Fertilizer Preparations	6-20-20	5-20-10	16-16-16	0-10-10	28-3-4	21-0-0	Customer Choice None
#/1000 sq.ft.	21	25	N/A	N/A	N/A	N/A	**

GRASS OR SOD PREPARATION

Till in organic matter, N,P,K and micro nutrients in addition to any lime gypsum or sulfur as directed above. Smooth soil surface and follow seed or sod producers direction for moisture and product application.

TREES AND SHRUBS

Excavate holes for planting shrubs and trees to at least twice the volume of the container. Prepare backfill for tree and shrub planting holes by mixing three parts of native soil (or imported top soil) with one part organic amendment (preferably nitrogen and iron fortified) and 2.5 pounds of 6-20-20 per yard of mix. For extended fertilization, place slow release fertilizer tablets in each hole per manufacturer's instructions. If 6-20-20 was not directly added to backfill mix, during backfill apply uniformly 1/2 oz of 6-20-20 per gallon containers, 2.5 oz per 5 gallons, 6 oz per 24 inch boxes.

Summary and Suggested Sequence of Soil Improvements (#/1000 Sq.Ft.)

Organic Amendment	4	Yd./1000 Sq.Ft.	Bulk organic amendment (nitrofied).
N-P-K Fertilizer	See above chart		
Micro Nutrients			
Copper	0.2	#	Copper sulfate
Zinc	0.5	#	Zinc Sulfate
Sulfate-Sulfur	1	#	Ammonium Sulfate

Maintenance Fertilization

Apply 5 pounds of Ammonium sulfate (21-0-0) per 1000 sq.ft.every month until plants become established. After established, apply 28-3-4 (or similar preparation) to provide desired growth rate and color.

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 03/03/2017
Date Submitted 02/28/2017

To: Becky Money
Kleinfelder Group
2882 Prospect Dr. Ste 200
Rancho Cordova, CA 95670

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following:
Location : 20173273.001A Site ID : B-37@0-2.5FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 73699-153719.

SOIL ANALYSIS

TYPE OF TEST	RESULTS	UNITS
Aluminum (Al)	8.61	ppm
Molybdenum (Mo)	0.218	ppm

Ammonium Bicarbonate/DTPA Extraction

Water Quality Consumer Con eport

For samples collected during 2015 in the Foothill/Sunset Water System

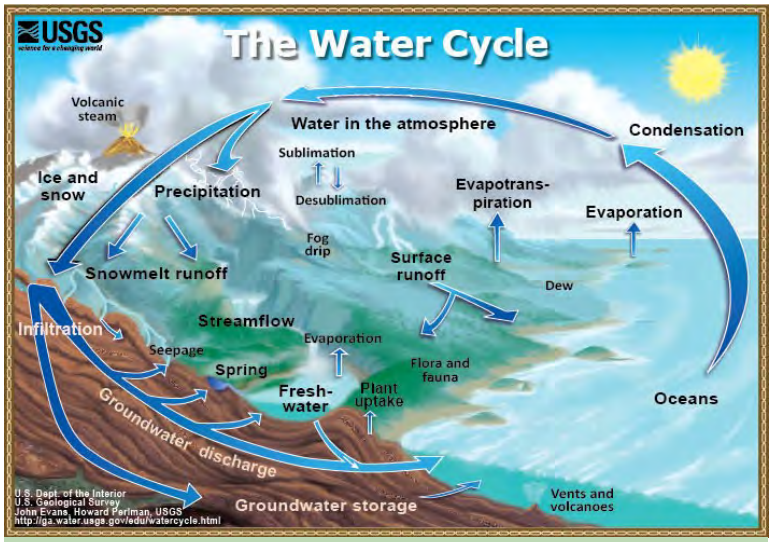
Placer County Water Agency is pleased to report this year - as we have each and every year since 1991 - that the drinking water supplied to you meets or exceeds state and federal public health standards for drinking water quality and safety. California water retailers, including PCWA, are required by law to inform customers about the quality of their drinking water. The results of PCWA's and monitoring programs of 2015 are reported in this If you have any ns about this report, please contact the PCWA Customer Services Center at (530) 823-4850 or (800) 464-0030.

Ensuring The Safety of Your Drinking Water

In order to ensure that tap water is safe to drink, the U.S. Environmental Prote Agency (USEPA) and the State Water Resources Controll Board (State Board) prescribe re ns which limit the amount of certain contaminants in water provided by public water systems. State Board regul ns also establish limits for contaminants in bo water that must provide the same prote n for public health.

About Your Drinking Water

Drinking water, including d water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More infor n about contaminants and pot al health ects can be obtained by calling the U.S. Environmental Protec n Agency's **Safe Drinking Water Hotline: 1-800-426-4791**

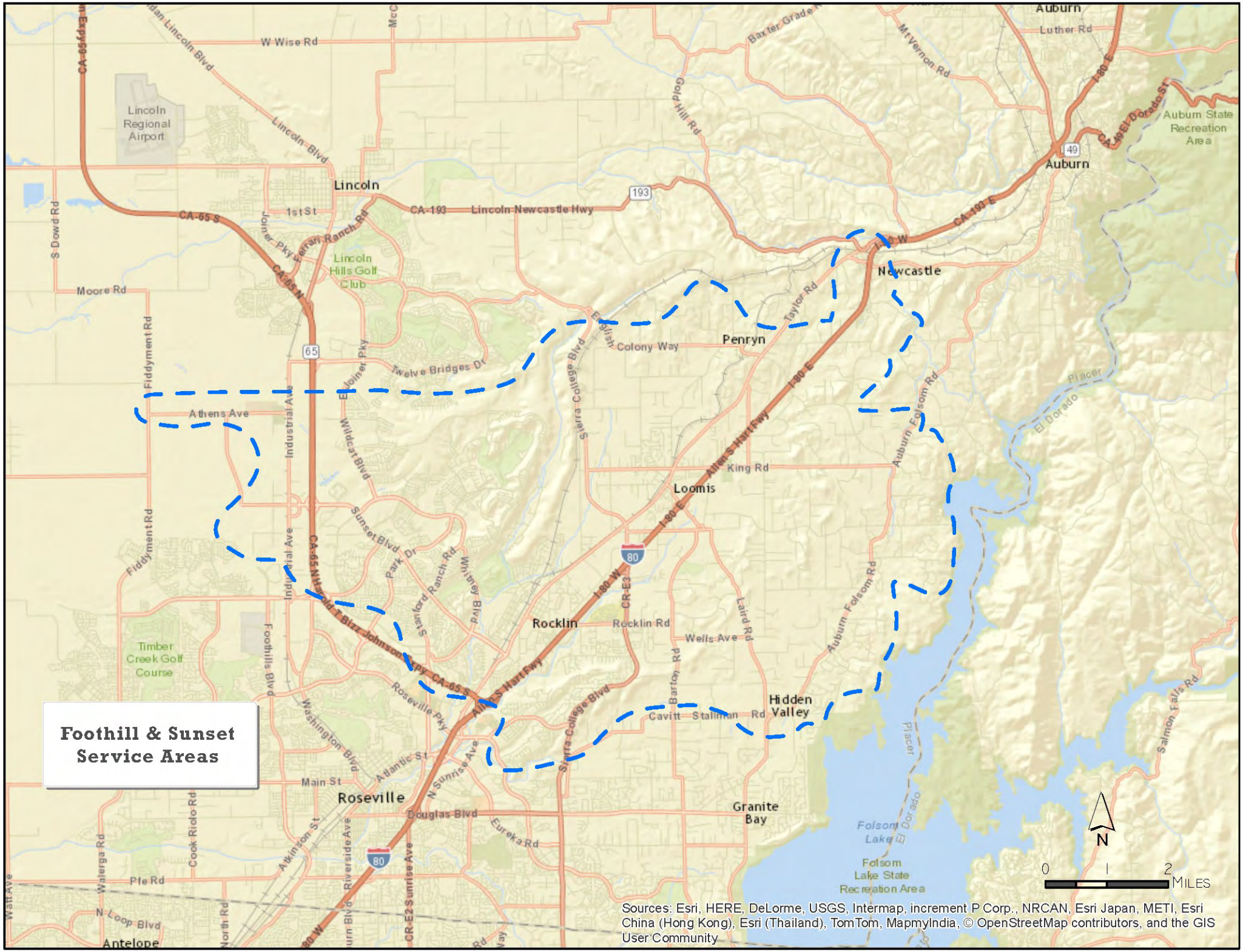


The Source of Your Water Supply

Your water originates in the Sierra snowpack. Surface water from the Yuba and Bear River watersheds and Lake Spaulding ws into the PG&E and PCWA delivery systems. This is supplemented with American River water. The water is treated at the water treatment plants listed in this report. PCWA has completed a Sanitary Survey and Source Water Assessment of the Yuba-Bear River watershed (2012) as well as for the American River watershed (2013). It was found the watersheds were vulnerable to contaminants from highways, roadways and railroads near rivers and canals, sep tanks, pipelines crossing canals, upstream re n, historic and mining o ons, o ns, and ber harvest. Contaminants associated with these a that could pose a threat to source water include but are not limited to sediment, bacteria, viruses, parasites, es, herbicides and trace metals. Historically, contaminant levels have been very low in the source water and watersheds. Full details of the Source Water Assessments may be seen at the Placer County Water Agency Business Center, 144 Ferguson Road, in Auburn.

Note about connection between PCWA and Roseville: During warm summer months, most customers in the area found at the link below receive City of Roseville water from about 6 a.m. to noon.

/www.pcwa.n s/docs/wq/Rocklin_Area.pdf


Foothill & Sunset Service Areas
Lincoln
Lincoln Regional Airport
Lincoln Hills Golf Club
Auburn
Auburn State Recreation Area
Newcastle
Penryn
Loomis
Rocklin
Hidden Valley
Granite Bay
Roseville
Antelope
Timber Creek Golf Course
Folsom Lake
Folsom Lake State Recreation Area
Placer
El Dorado
W Wise Rd
Lincoln Blvd
Lincoln Newcastle Hwy
CA-193
CA-65 S
CA-65 N
CA-65 N Harold T Bizz Johnson Expy
Allen S Hart Fwy
I-80 E
I-80 W
CA-49 El Dorado St
CA-193 E
Luther Rd
Mt Vernon Rd
Baxter Grade Rd
Gold Hill Rd
Moore Rd
Fiddyment Rd
Athens Ave
Industrial Ave
Twelve Bridges Dr
Colony Way
Taylor Rd
Sierra College Blvd
King Rd
Auburn Folsom Rd
Sunset Blvd
Park Dr
Stanford Ranch Rd
Whitney Blvd
Rocklin Rd
Wells Ave
Laird Rd
Barton Rd
Cavitt Stallman Rd
Foothills Blvd
Roseville Pky
Washington Blvd
Atlantic St
Main St
N Sunrise Ave
Douglas Blvd
Eureka Rd
Atkinson St
Riverside Ave
Cook Riolo Rd
Walerga Rd
Pfe Rd
N Loop Blvd
Salmon Falls Rd
Placer
El Dorado
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
N
0
1
2
MILES

Foothill/Sunset Water Quality Results

Primary Drinking Water Standards

Turbidity Performance Standards (that must be met through the water treatment process)

Turbidity is a measurement of clarity or the level of suspended matter in the water. In reporting turbidity, the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits are specified.

Turbidity of th tered water must:

1. Be less than or equal to 0.3 NTU in 95% of measurements in a month.
2. Not exceed 1 NTU at a me.

	PCWA	Roseville
Lowest monthly percentage of samples that met Turbidity Performance Standard No. 1	**100%**	**100%**
Highest single turbidity measurement during the year	**0.18**	**0.06**
Number of violations of any surface water treatment requirements	**0**	**0**

CONSTITUENT	UNITS	MCL or [MRDL]	PHG, (MCLG) or [MRDLG]	PCWA Range and Average or (HRAA)	Roseville Range and Average or (HRAA)	Typical Source of Contaminant
Total Trihalomethane	ug/L	80	None	36-83 (62.25)	N/A[1]	Byproduct of drinking water disinfec on
Total Haloac c Acids	ug/L	60	None	22-52 (39.75)	N/A[1]	Byproduct of drinking water disinfec on
Chlorine	mg/L	[4]	[4]	0-1.22 (0.6)	N/A[1]	Drinking water disinfectant added for treat-ment
Total Organic Carbon	mg/L	TT=RAA<2	None	0.9-1.4 (1.1)	0.8-1.4 (1.1)	Various natural and manmade sources
Fluoride	mg/L	2	1	ND	0.05-1.2 0.76	Water addi ve that promotes strong teeth

[1]Samples are collected in the distri em, so PCWA levels represent the quality of the water delivered to the customer.

Secondary Drinking Water Standards

Total Dissolved Solids	mg/L	1,000	None	50-53 51.5	55	/ leaching from natural deposits
Speci Conductance	uS/cm	1,600	None	68-72 70	98	Substances that form ions when in water
Chloride	mg/L	500	None	4.9-5 4.95	4.3	/ leaching from natural deposits
Sulfate	mg/L	500	None	6.7-8.1 7.4	7.3	/ leaching from natural deposits
Odor	Units	3	None	ND	2.5	Naturally-occurring organic materials

Monitoring of Unregulated Substances

Sodium	mg/L	None	None	5.1-5.2 5.15	4.6	/ leaching from natural deposits
Hardness	mg/L	None	None	17-18 17.5	37	/ leaching from natural deposits

DEFINITIONS: Understanding Your Water Quality Report

MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. Primary MCL's are set as close to the PHG's (or MCLG's) as is economically and technologically feasible. Secondary MCL's are set to protect the odor, taste and appearance of drinking water.

MCLG: Maximum Contaminant Level Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health. Set by the U.S. Environmental Prot n Agency.

MRDL: Maximum Residual Disinfectant Level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that ad n of a disinfectant is necessary for control of microbial contaminants.

MRDLG: Maximum Residual Disinfectant Level Goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not ect the ben ts of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard. MCL's and MRDL's for contaminants that health along with their monitoring and repor g requirements, and water treatment requirements.

PHG: Public Health Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health. PHG's are set by the California Environmental Prot n Agency.

AL: Action Level. The concentr on of a contaminant, which if exceeded, triggers treatment or other requirements which a water system must follow.

NTU: Nephelometric Turbidity Units. A measure of the clarity of water. Turbidity is monitored because it is a good indicator of water quality. High turbidity can hinder t veness of disinfectants.

TT: Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.

pCi/L: picocuries per liter. A measure of ra on.

mg/L: milligrams per liter or parts per million (ppm)

ug/L: micrograms per liter or parts per billion (ppb)

uS/cm: MicroSiemens per centimeter

RAA: Running Annual Average

HRAA: Highest Running Annual Average

<: Less Than

ND: ND or Non-Detected: An analysis result below detectable levels.

NA: Non-Applicable

Environmental Influences on Drinking Water

The sources of drinking water (both tap and water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, ra material, and can pick up substances res from the presence of animals or from human ty. Contaminants that may be present in source water include:

• **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, sep systems, agricultural livestock o ons, and wildlife.

• **Inorganic contaminants**, such as salt and metals, which can be naturally-occurring or result from urban storm water industrial or domes c wastewater discharges, oil and gas pro , mining or farming.

• **Pesticides and herbicides**, that may come from a variety of sources such as agriculture, urban storm water and res s.

• **Organic chemical contaminants**, including synthe and vol organic chemicals, which are by-products of industrial processes and petroleum produc , and can also come from gas , urban storm water agricultural appli on and c systems.

• **Radioactive contaminants**, that can be naturally-occurring or be the result of oil and gas produ and mining

Statement on Lead

(none found in this system)

Infants, young children, and pregnant women are typically more vulnerable to lead in drinking water than the general pop on. It is possible that lead levels at your home may be higher than at other homes in the community as a result of the materials used in your home's plumbing. If your water faucet has not been used for several hours, you can minimize the for lead exposure by ushing the faucet for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. Addi informa is available from the USEPA Safe Drinking Water Hotline (1-800-426-4791) or at *http://www.epa.gov/safewater/lead*.

Note to At-Risk Water Users

Some people may be more vulnerable to contaminants in drinking water than the general pop on. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be ularly at risk from These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infec by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

What You Should Know About Cryptosporidium

Cryptosporidium is a microbial pathogen found in most surface waters throughout the U.S.. Although n removes Cryptosporidium, the most commonly used methods cannot guarantee 100 percent removal. We conducted a two-year study on Cryptosporidium during 2006 and 2007, and our monitoring indicated the presence of these organisms in our source water in ranges from non-detect to 0.2 organisms per liter. We are in the middle of another 2 years of monitoring, and so far all results are non-detect. Again, these results are from the untreated, raw water. The design of the EPA study conducted here did not call for treated water samples. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Inges of Cryptosporidium may cause an abdominal n. Symptoms of infe n include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immune-compromised people are at greater risk of developing life-threatening illness. We encourage immune-compromised individuals to consult their health care provider regarding appropriate prec ns to take to avoid n. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

2015 Testing Results

Measurements reported here were collected in 2015 (unless otherwise noted). In accordance with federal ns, data is from the most recent tests. We are allowed to monitor for some contaminants less than once per year because concentra of these contaminants do not change frequently.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Frequently Asked Questions About Water Quality

It is important for you to know that we take our customers' concerns very seriously. We feel that you wouldn't be calling if there weren't cause for concern, so we investigate every claim fully and in a timely manner before closing a case. Below are some answers to the most common questions or concerns. FOR INFORMATION about this report or to report any concerns with the quality of water in your home or a perceived risk to the quality of our water source, PCWA customers are invited to contact the PCWA Customer Service Center at (530) 823-4850 or (800) 464-0030.

Do we have hard water?

Most of the water served to you is less than 20 mg/L (milligrams per liter) PCWA water in general is on the low end of water. Roseville water, at 37 mg/L is l withing the range. General guidelines for class ca of waters are: 0 to 60 mg/L as calcium carbonate is class ed as 61 to 120 mg/L as moderately hard; 121 to 180 mg/L as hard; and more than 180 mg/L as very hard.

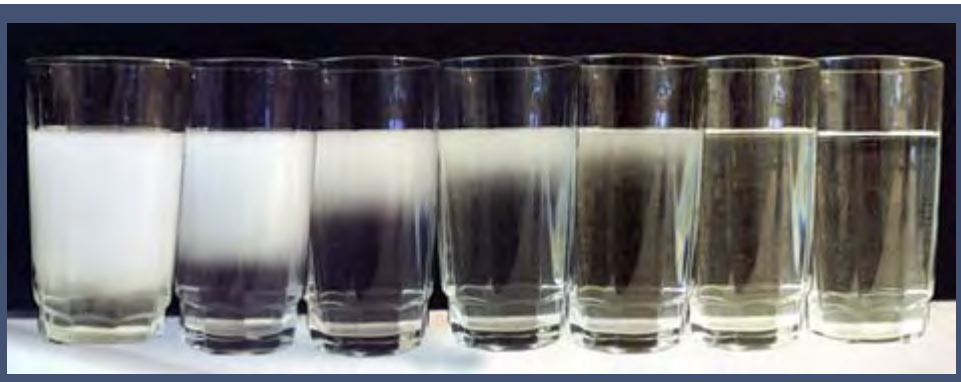
Is there Fluoride in my water?

PCWA does not date its water. Fluoride does exist naturally in a PCWA well which was run brie uring the year. There is a very small n of the City of Rocklin, which receives water from the City of Roseville during high demand in warm months only. In addi our Bianchi system receives Roseville water at all s. Roseville is required to oridate its water. To maps of these areas, you can go to: h p://www.pcwa.net/water-resources/water-quality.html

My water smells like Chlorine!

Chlorine is required in the distr on system to keep bacteria from making it to your tap. We regulate our Chlorine dosage very strictly so that we have just enough without having too much. The maximum residual level for Chlorine is 4 mg/L (milligrams per liter), and a common level for our systems is between 0.5 and 1.5 mg/L. Some people are more sensi e to the smell of Chlorine in water. It is common for people to think that the level of the Chlorine must be too high under these circumstances; however, we've found that the most common reason for smelling Chlorine at your tap is when the Chlorine is diss ng or the level is dropping. The reason for this is that the water sits in your plumbing before you use it. Most likely, if you your taps out, the smell will disappear.

Why is my tap water milky or cloudy?



This is caused by air bubbles in the water. It is completely harmless. Cold water from snowmelt has the to hold lots of air. As the water warms a bit on its way to your tap, it has more to release that air. When you turn on your tap, the rapid red on in pressure causes the air to come out of so and creates the milky look you see. If this is the case, it will clear before your eyes as in the picture.

How do I know my water is safe?

Distr operators and treatment plant operators d by the State Water Resources Control Board collect hundreds of bacteriological samples each year throughout the water distr n systems as well as performing thousands of individual tests in the treatment facili and in the distrib system, of which only the detected co ts are found in your annual Consumer nce Report. Field tests for things like temperature, turbidity, pH and chlorine residual help to let us know that our water is maintaining its quality throughout the distribu n system.

Frequently Asked Questions About Water Quality

Continued...

My water is dirty!

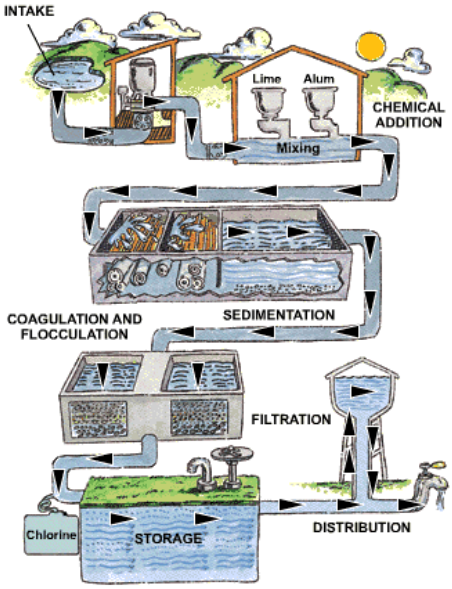
It is actually very common for people to experience discolored or "dirty" water at their tap. In most cases, we can trace this n to a ular aspect of the household plumbing. It is very common for a water heater to corrode or rust and cause discolored water in the hot water. You can test this by turning your tap to the full hot posi and observe whether the water is discolored. If the water is discolored in your hot water, but not cold, you can be reasonably certain the issue lies in your water heater. If the problem occurs in the cold water as well, and doesn't clear up running for a few minutes, we may need to the main line. If you get discolored water out of your cold water tap and it clears up a running for several minutes, the main line is likely clean and you may have a plumbing xture or an old galvanized line causing the problem.

Why are there pink or dark stains in my toilet or around my drains?

Airborne organisms are usually the cause. You will see grey, black, or some s pink my stains on surfaces that are regularly moist, including toilet bowls, shower heads, shower drains, sink drains, dishwashers, shower and bath s and walls. These organisms are not in the drinking water, but they moist areas of your house to thrive. The only way to control these organisms is to disinfect the surfaces regularly, and ven the area well.

How is my water treated?

Your water is treated by conve onal methods, zing , , sedim n, ltr and nally disinfec n. The facility or facili serving your area are operated by State Water Resources Control Board cer d operators. It may also be comfor for you to know that our facili have built-in fail-safes which will immediately shut the treatment process down and not allow any water to the system if something within the facility is not ope- correctly. The operators receive alarms for immediate inter- ve so they can correct the problem and begin trea water again.



My water tastes like chemicals!

Another common call we get is that the water has a strong chemically taste all of a sudden. Most s, this can be traced to the either the Chlorine topic covered earlier, or to a hose bib being le on. This is most common during warm s of year when the hot sun beats down on a pressurized hose and creates backpressure. When you open a tap inside the house, you can be sure that high pressure hose water feeds right into your house, and it doesn't taste good. The best way to avoid this is to always shut your hose at the hose bib shut- valve, and depress- urize your hose. For this reason, it is not a good idea to have your hose bib set up as it is in the picture.

KLEINFELDER

Bright People. Right Solutions.

Appendix C

1605 School Street, #4
Moraga CA 94556
925 (808-8965)

February 13, 2017

Mr. Tim Williams
Kleinfelder
2882 Prospect Park Drive, Suite 200
Rancho Cordova, CA 95670

Subject: Seismic Refraction Survey
Costco Loomis Site
Sierra College Blvd and Brace Road
Loomis, California

Dear Mr. Williams:

1.0 INTRODUCTION

This letter presents the results of Advanced Geological Services, Inc. (AGS) seismic refraction survey in support of planned grading operations for the development of a Costco store at the corner of Sierra College Boulevard and Brace road in Loomis, California (Figure 1). The objective was to assess the depth and excavation characteristics (rippability) of bedrock. The survey was performed on January 27 and 31, 2017 by AGS senior geophysicist Roark W. Smith and his assistant. As directed by Kleinfelder, the survey consisted of six 230-foot long seismic lines arranged in three groups of two lines configured in an "+" or cross pattern.

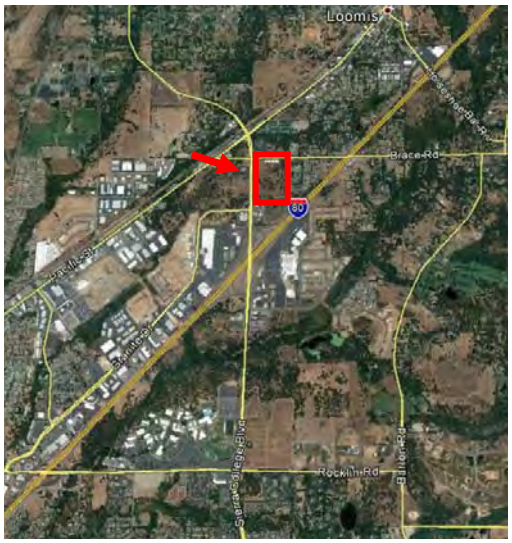


Figure 1- Site Location in Loomis CA

2.0 SUMMARY OF FINDINGS

The results of the seismic refraction survey are presented on Figures 2 through 6, which show the seismic line locations and profiles of subsurface velocity layering. In general, the refraction data indicate the presence of three velocity layers within the upper 40 feet of subsurface— Layer V_1 is the uppermost 2- to 10-foot thick low-velocity layer representing surficial soil and deeply-weathered bedrock. Layer V_2 is the middle, medium-velocity layer ranging from 5 to 27 feet in thickness that represents more compacted soil and weathered bedrock. Layer V_3 is the high-velocity basement layer ranging from 12 to 30 feet in depth that represents little-weathered bedrock.

Layer V_2 exhibits P-wave velocities ranging from 2,400 to 3,400 feet per second (fps), which indicates that the subsurface should be readily rippable through this layer to depths ranging from 12 to 30 feet; although, except for a small area, the entire site appears to be rippable to a depth of

at least 20 feet. Layer V_3 occurs at depths ranging from 12 to 30 feet below ground surface (bgs) and, exhibiting P-wave velocities in excess of 9,000 fps, is considered to be "non-rippable." The rippability assessment is made on the basis of the Caterpillar Performance Handbook "rip chart", which correlates seismic velocity and rippability.

3.0 SITE DESCRIPTION

The survey was performed within a roughly 800- by 1,000-foot undeveloped lot east of Sierra College Boulevard and south of Brace Road (Figure 2). At the time of the survey, the lot was largely an open, gently undulating grassy field with some trees, and standing water from a recent rainfall event was present in low-lying areas.

4.0 SEISMIC REFRACTION (SR) METHOD OVERVIEW

The seismic refraction method uses compressional (P-) wave energy to delineate seismic velocity layers within the subsurface. Interpretation entails correlating the velocity layers to geologic features such as soil and various types of bedrock. To perform a refraction survey, an elastic wave (compressional, or P-wave) is generated at certain locations (shotpoints) along a survey line. The P-wave energy is usually produced with a small explosion or by striking the ground with a sledgehammer. As the P-wave propagates through the ground it is refracted along boundaries between geologic layers with different seismic velocities.

Part of the refracted P-wave energy returns to the ground surface where it is detected by vibration-sensitive devices called geophones, which are placed in a co-linear array along the seismic survey line. The geophone data are fed to a seismograph, where they are recorded, and then to a computer, where they are analyzed to determine the depth and velocities of subsurface seismic layers. Key data for refraction analysis are the positions of the geophones and shotpoints along a seismic line, and the amount of time it takes for the refracted wave to travel from the shotpoint to each geophone location. Because the P-wave is the fastest traveling of all types of seismic waves, it can be readily identified as the first deflection ("first break") on a seismic trace.

Additional discussion of the refraction method, its limitations, and the relationship between seismic velocity and geologic materials is presented in Appendix A.

5.0 FIELD PROCEDURES

AGS obtained seismic refraction data along six lines as shown on an aerial image map that was emailed to AGS by Kleinfelder before the field work began. As shown on the map, the six lines were grouped into three sets of two perpendicular lines arranged in an "+" pattern; two pairs of lines were located in the northern half of the site and the third pair was located in southwest corner of the site.

Before beginning the seismic survey, AGS marked the line locations in the field using adjacent buildings and onsite trees for reference. Using a fiberglass tape measure, AGS then placed 24

geophones on the ground at 10-foot intervals to form a 230-foot long geophone array. The geophones were coupled to the ground by means of the 3-inch metal spikes attached to the geophone base. From five to seven shotpoints were used along each array, with shot points located 5 feet beyond each end geophone, at the midpoint of the geophone array, and at quarter-points along the array. Off-end shotpoints located 20 feet beyond the end geophones of the arrays were also used. AGS produced P-waves through multiple impacts with a 16-lb sledge hammer against a metal plate placed on the ground surface at each shotpoint location. Fifteen hammer blows were used ("stacked") at the off-end shotpoints, 10 blows were used for end shots, seven blows at the quarter shots, and five blows were used at the center shotpoint. The P-waves produced by the hammer impacts were detected using Mark Products 14-Hz high output geophones. The detected seismic signals were recorded using a DAQLink II seismic system connected to a laptop computer.

After the seismic data were obtained, AGS performed a hand-level survey to measure the relative elevation changes along the seismic line so the ground surface topography could be incorporated into the data analysis. After marking the shotpoint locations with florescent pink spray paint, AGS then picked up and moved the seismic gear to the next line and repeated the process until the survey was completed. After the seismic survey was completed AGS used a Trimble Pro-XR Global Positioning System (GPS) to record the seismic line locations. To help reference the seismic survey to the site AGS also GPS-mapped nearby survey lath marking test pit and control point locations.

6.0 DATA PROCESSING AND ANALYSIS

The seismic refraction data quality for this project was good and, for the most part, first break picks could be made with confidence. Data quality was enhanced by "stacking," which entailed using multiple hammer blows at each shotpoint location to improve the signal-to-noise ratio. The additive affect of stacking multiple hammer blows at the same location enhances or increases the amplitude of the signal (i.e., the refracted wave arrival) while amplitude of the background noise, which, being random in nature, tends to cancel itself on successive hammer blows and remains largely unchanged. Stacking was made necessary by the vibratory noise from the nearly constant vehicle traffic along the nearby Sierra College Boulevard. Kleinfelder's concurrent drilling activities also produced some noise but, for the most part, the drill crews silenced their equipment during seismic data acquisition.

Seismic data were transferred from the seismograph to a desktop computer where they were processed using the *SeisImager* software package by Geometrics, Inc. Briefly, *SeisImager* is a computer inversion program that generates an initial velocity layer model, produces synthetic data from the model, and then adjusts the model so that the synthetic data better matches the observed field data (i.e., the arrival times). The agreement between the synthetic and observed data provides an indication of how well the model represents the actual subsurface conditions.

First, AGS used the *SeisImager* module *PickWin* to interpret ("pick") the P-wave arrivals ("first breaks") for each of the shotpoint data sets ("shot gathers") per line. *PickWin* was also used to

check (against the geophysicist's field log) that the proper locations were assigned to the geophones and shotpoints. Next, the first break files were fed to the SeisImager module *PlotRefra*, which was used review time-distance (TD) plots for the seismic lines and assign a seismic layer to each arrival time. For the initial refraction analysis, each P-wave arrival is considered to have refracted from a distinct seismic layer. The number of layers resolved by the seismic survey, and their thickness and average velocity, is indicated by straight line segments on the TD plot; because these straight-line segments indicate a constant velocity condition within the subsurface, they tend to represent a distinct geologic layer. The topographic elevation files were incorporated into the analysis at this point. Next, a time-term inversion was performed to produce preliminary layered velocity models.

The layered velocity models were then used as starting models for the tomographic inversion process, which was used to assess lateral velocity variations along each seismic line. Briefly, tomographic inversion is a grid-based modeling process wherein the subsurface is divided into rectangular cells based on the geophone spacing. The tomography software assigns a velocity to each cell, produces a synthetic arrival-time data set based on seismic raypaths projected through the velocity grid, and then compares the synthetic data to the real data recorded in the field. The cell velocities are then adjusted and re-adjusted until the synthetic data achieve a "best fit" with the observed field data. Tomographic modeling is often used to complement layered modeling at sites where gradual velocity transitions, such as those often seen between weathered and unweathered bedrock, are expected. Tomographic modeling can also depict lateral velocity variations within the subsurface more accurately than a layered modeling approach.

7.0 RESULTS

The results of the seismic refraction survey are summarized on Table 1, below, and presented on Figures 2 through 5, which show the seismic line locations and models (profiles) of subsurface velocity layering that were calculated from the seismic refraction data. Figure 6 presents the tomographic models, which were prepared to assess localized velocity variations along the seismic lines.

In general, the refraction data indicate the presence of three velocity layers within the upper 40 feet of subsurface, which have been designated as V_1, V_2 and V_3. Layer V_1 is the uppermost 2- to 10-foot thick low-velocity layer representing surficial soil and deeply-weathered bedrock. Layer V_2 is the intermediate medium-velocity layer ranging from 5 to 27 feet in thickness representing compacted soil and/or weathered bedrock. Layer V_3 is the high-velocity basement layer ranging from 12 to 30 feet in depth that represents little-weathered bedrock.

Layer V_2 exhibits P-wave velocities ranging from 2,400 to 3,400 feet per second (fps), which indicates that the subsurface should be readily rippable through this layer to depths ranging from 12 to 30 feet; although, except for a small area (see Figure 2), the entire site appears to be rippable to a depth of at least 20 feet. Layer V_3 occurs at depths ranging from 12 to 30 feet below ground surface (bgs) and, exhibiting P-wave velocities in excess of 10,000 fps, is considered to be "non-rippable." It is worth noting that layer V_3 exhibits lower velocity along

lines SL-3 and SL-4 (in the northeast portion of the site), which may be caused by a natural geologic variation of bedrock properties across the site.

The rippability assessment is made on the basis of the Caterpillar Performance Handbook "rip chart", which correlates seismic velocity and rippability. The Handbook classifies granitic rock exhibiting a P-wave velocity less than 6,800 feet per second (fps) as "rippable" with a D9, while such rock exhibiting P-wave velocities between 6,800 and 8,000 fps is classified as "marginally rippable". Rock exhibiting P-wave velocities greater than 8,000 fps is classified as "non-rippable". Velocity information from the seismic survey is summarized in Table 1; rippability information is summarized in Table 2.

Table 1 Velocity Summary (feet per second) from Layer Models

Seismic Line	Layer V_1 (topsoil)	Layer V_2 (weathered bedrock)	Layer V_3 (little-weathered bedrock)	Approx depth to V_3 (feet)
SL-1	950	2,750	17,700	18 - 30
SL-2	1,000	2,400	13,900	12 - 20
SL-3	950	3,100	9,900	18 - 24
SL-4	1,050	3,250	10,600	18 - 21
SL-5	1,250	3,400	12,300	12 - 29
SL-6	1,100	3,400	12,600	19 - 25

The tomographic models (Figure 6) indicate that the boundary between layers V_1 (soil) and V_2 (weathered bedrock) is transitional in nature, while the boundary between layers V_2 (weathered bedrock) and V_3 (little-weathered bedrock) is more pronounced. A line showing the V_2 - V_3 boundary from the velocity layer models is shown on the tomographic models for reference. Localized lower-velocity zones in layer in V_3, indicative of more deeply-weathered bedrock, are evident along lines SL-1, SL-2, SL-5 and SL-6. These lower–velocity zones may be associated with more intense weathering along bedrock fractures.

8.0 EXCAVATION CHARACTERISTICS (RIPPABILITY)

Seismic velocity charts relating seismic velocity and excavation characteristics have been developed from field tests by others. These charts list the seismic velocity of various types of bedrock materials and their relative ease of excavation using different types of rippers. Caterpillar Tractor Company publishes a performance manual that lists ripper performance charts for various size tractors and types of rippers. The range of rippability obtained from the ripper performance chart from the Caterpillar Performance Handbook, 12th Edition (2000) is as follows (in feet per second):

Table 2 Rip Chart for Granitic Rock (from Caterpillar Performance Handbook)

Ripper	Rippable	Marginally Rippable	Non-Rippable
D8R	less than 5,800	5,800 to 6,800	greater than 6,800
D9R	less than 6,800	6,800 to 8,000	greater than 8,000
D10R	less than 7,200	7,200 to 8,500	greater than 8,500

This information should only be used as a general guide, however, as many other factors should also be considered. These factors include the rock jointing and fracture patterns, the experience of the equipment operator, and the equipment and excavation methods selected. Based on the observed velocities, it appears that the bedrock beneath the seismic refraction lines is rippable for a D9R to a depth of at least 40 feet. However, this information should be combined with a complete and thorough analysis of geotechnical boring data, as well as local ripping experience (if available) to make a final assessment.

9.0 CLOSING

All geophysical data and field notes collected as a part of this investigation will be archived at the AGS office. The data collection and interpretation methods used in this investigation are consistent with standard practices applied to similar geophysical investigations. The correlation of geophysical responses with probable subsurface features is based on the past results of similar surveys although it is possible that some variation could exist at this site. Due to the nature of geophysical data, no guarantees can be made or implied regarding the targets identified or the presence or absence of additional objects or targets.

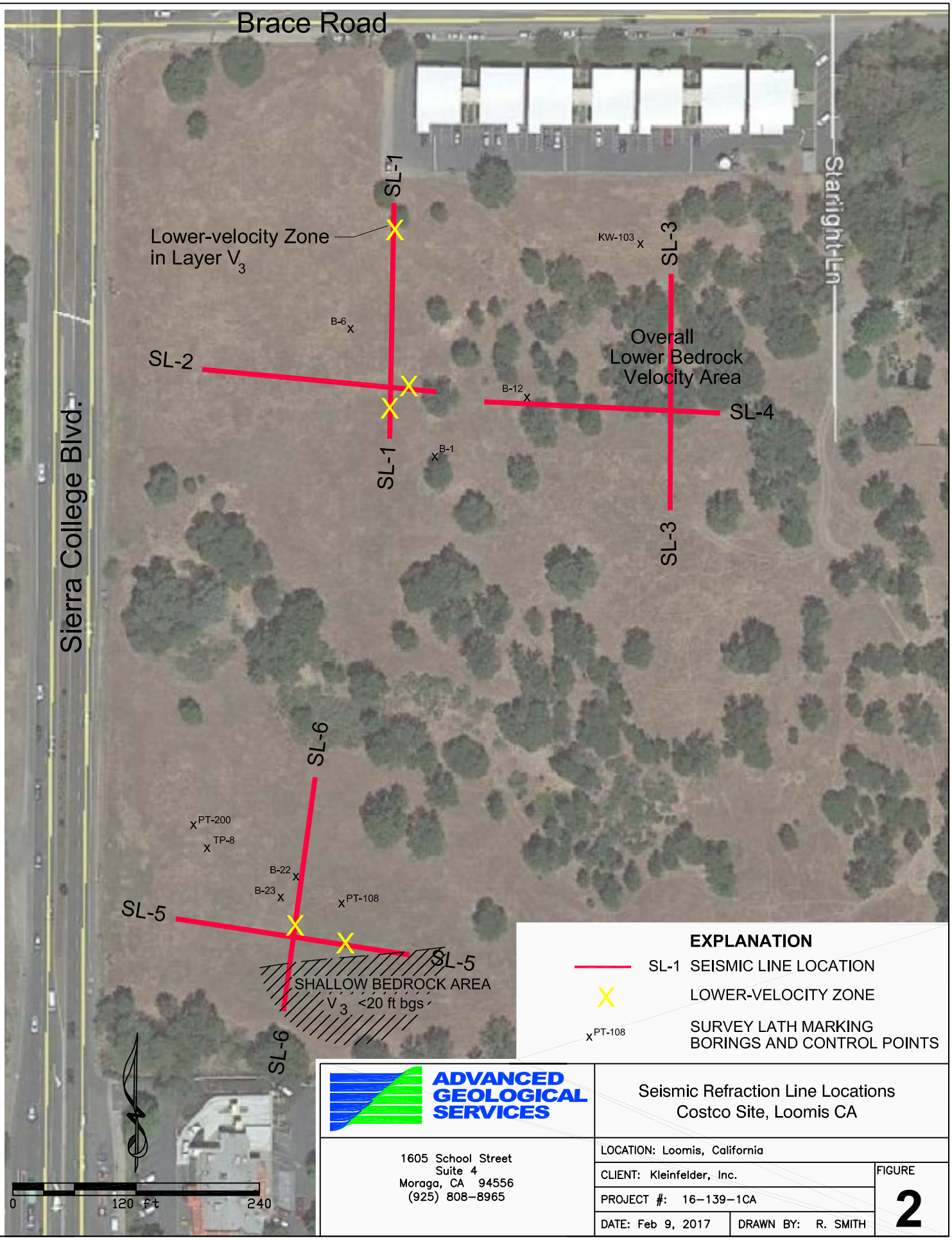
AGS appreciates working for you. We enjoyed this project and we look forward to working with you again.

Sincerely,

Roark W. Smith
Senior Geophysicist
Advanced Geological Services, Inc.

Figures:	Figure 1	Seismic Refraction Survey Area (imbedded in Report text, above)
	Figure 2	Seismic Refraction Line Locations
	Figure 3	P-wave Velocity Layer Models, SL-1 and SL-2
	Figure 4	P-wave Velocity Layer Models, SL-3 and SL-4
	Figure 5	P-wave Velocity Layer Models, SL-5 and SL-6
	Figure 6	Tomographic Velocity Models- All Seismic Lines

Attachments: Appendix A: Seismic Velocity and Limitations of the Refraction Method



ADVANCED GEOLOGICAL SERVICES

1605 School Street
Suite 4
Moraga, CA 94556
(925) 808-8965

Seismic Refraction Line Locations
Costco Site, Loomis CA

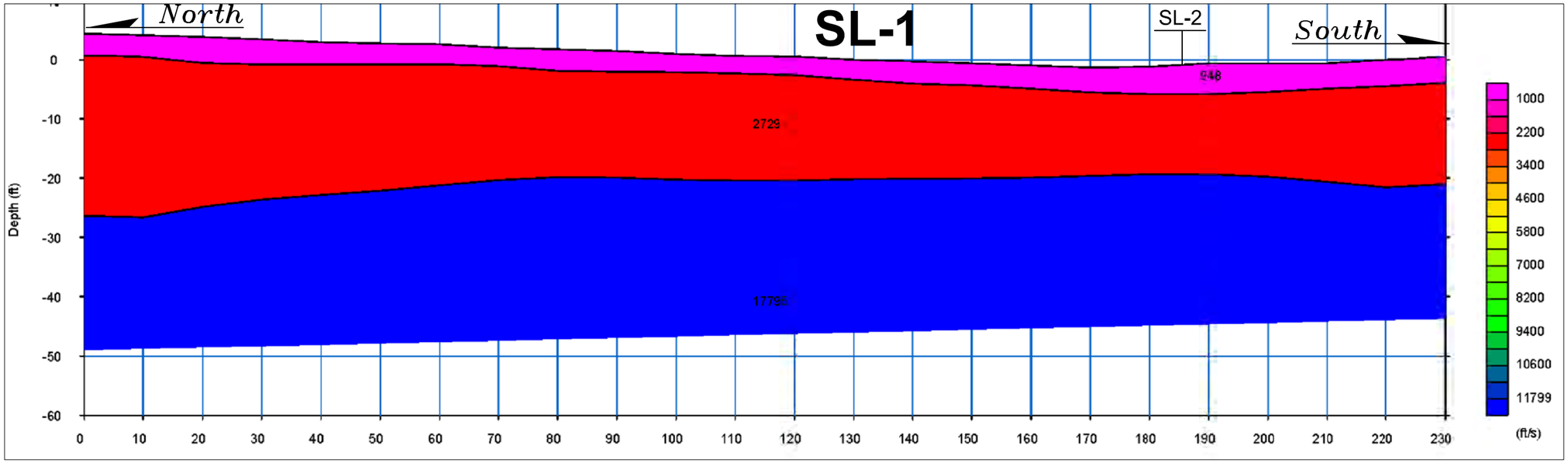
LOCATION: Loomis, California

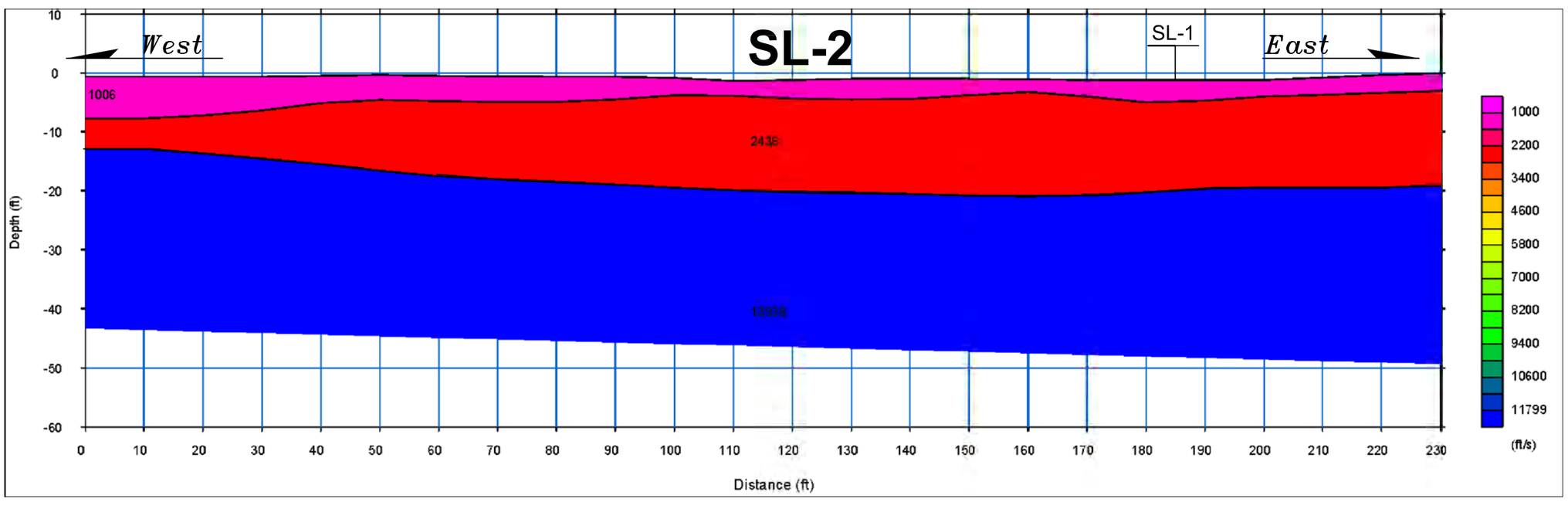
CLIENT: Kleinfelder, Inc.

PROJECT #: 16-139-1CA

DATE: Feb 9, 2017 DRAWN BY: R. SMITH

FIGURE 2





SEISMIC LINE LOCATIONS

ADVANCED GEOLOGICAL SERVICES

1605 School Street
Suite 4
Moraga, CA 94556
(925) 808-8965

Seismic Refraction Survey Results-
P-wave Velocity Layer Models for
Lines SL-1 and SL-2

LOCATION: Loomis, California

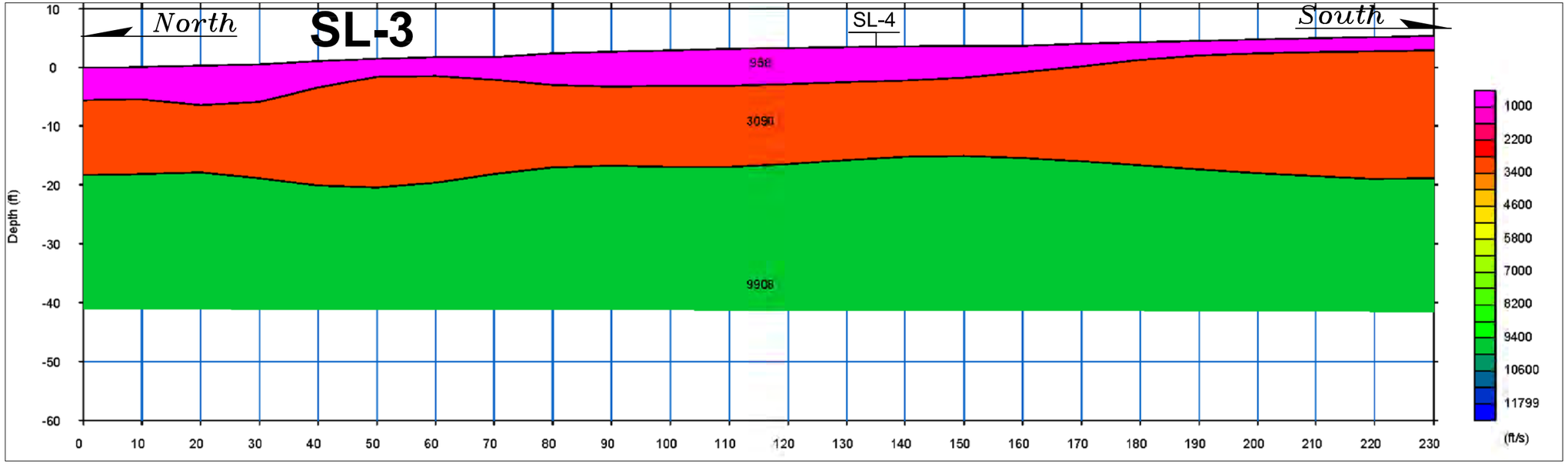
CLIENT: Kleinfelder, Inc.

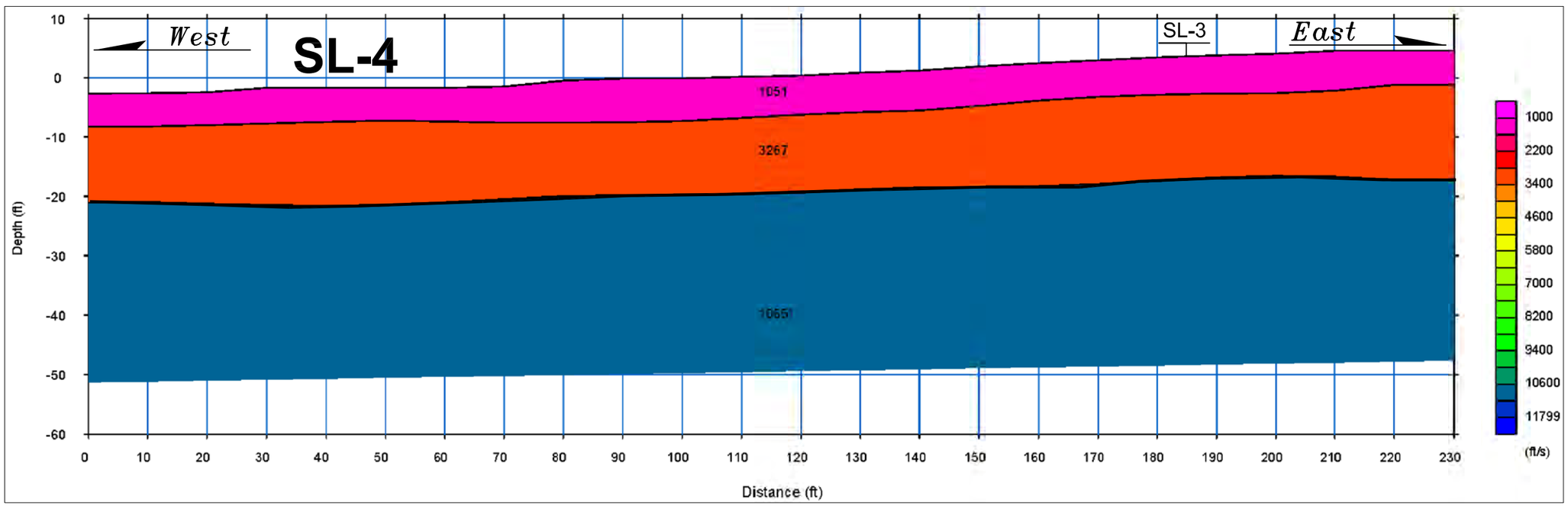
PROJECT #: 16-139-1CA

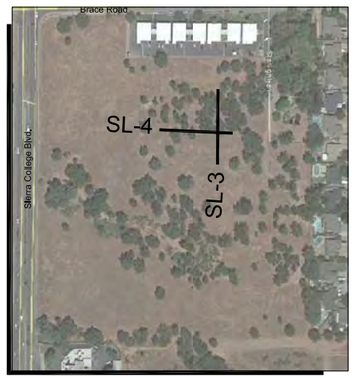
DATE: Feb 9, 2017

DRAWN BY: R. SMITH

FIGURE 3







SEISMIC LINE LOCATIONS

ADVANCED GEOLOGICAL SERVICES

1605 School Street
Suite 4
Moraga, CA 94556
(925) 808-8965

Seismic Refraction Survey Results-
P-wave Velocity Layer Models for
Lines SL-3 and SL-4

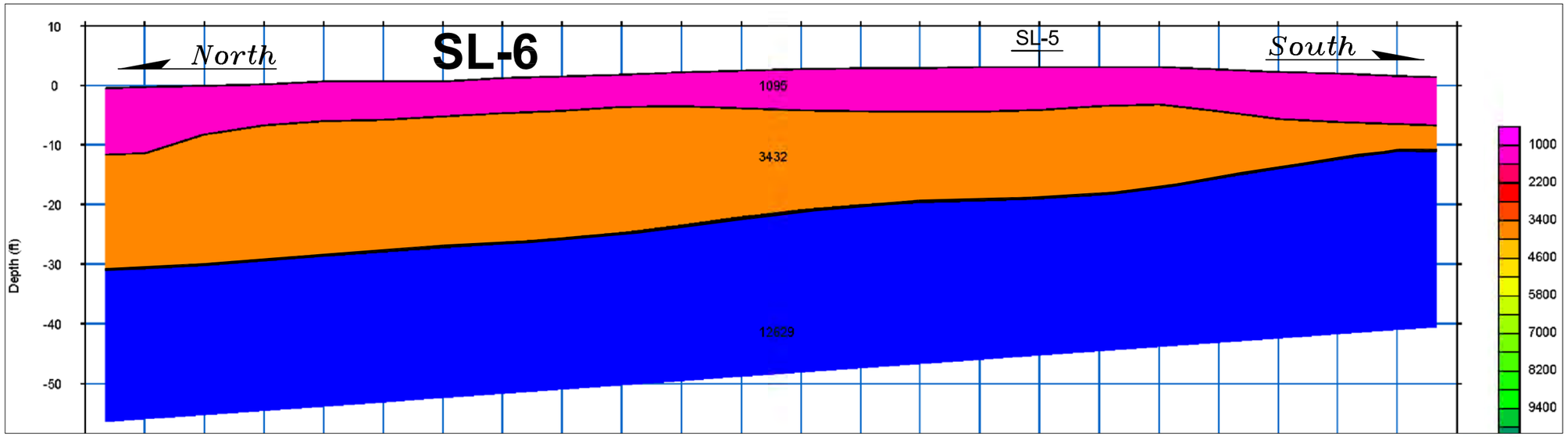
LOCATION: Loomis, California

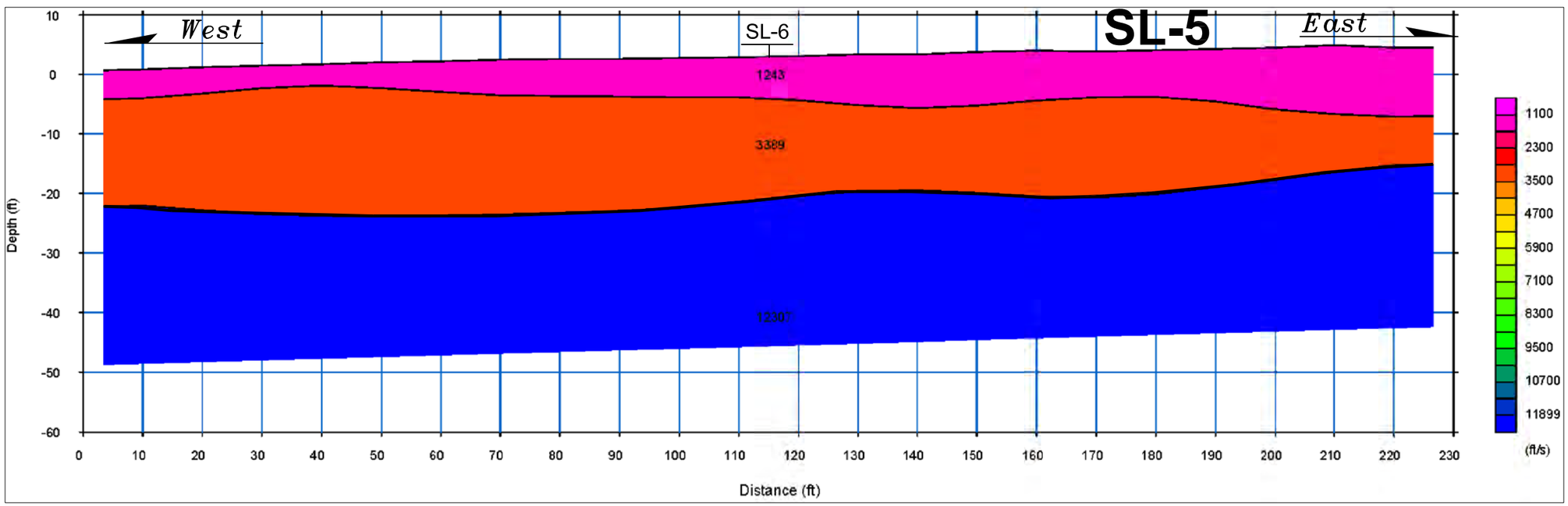
CLIENT: Kleinfelder, Inc.

PROJECT #: 16-139-1CA

DATE: Feb 9, 2017 DRAWN BY: R. SMITH

FIGURE 4





SEISMIC LINE LOCATIONS

ADVANCED GEOLOGICAL SERVICES

1605 School Street
Suite 4
Moraga, CA 94556
(925) 808-8965

Seismic Refraction Survey Results-
P-wave Velocity Layer Models for
Lines SL-5 and SL-6

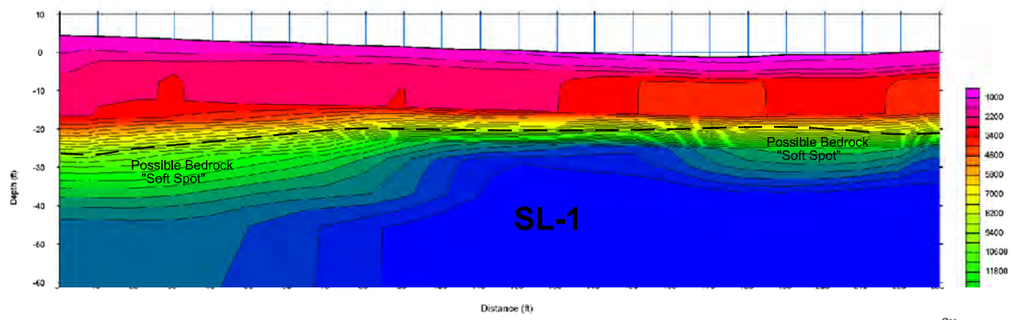
LOCATION: Loomis, California

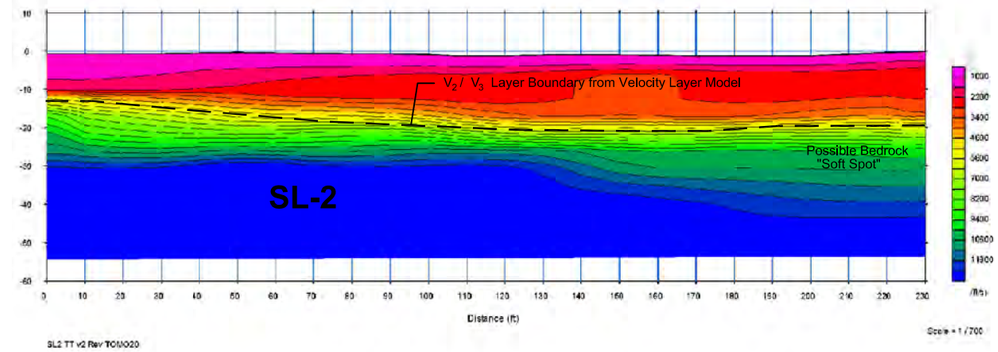
CLIENT: Kleinfelder, Inc.

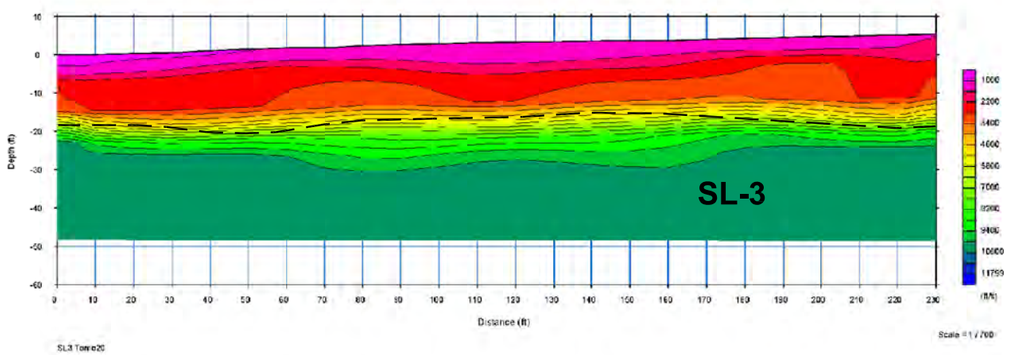
PROJECT #: 16-139-1CA

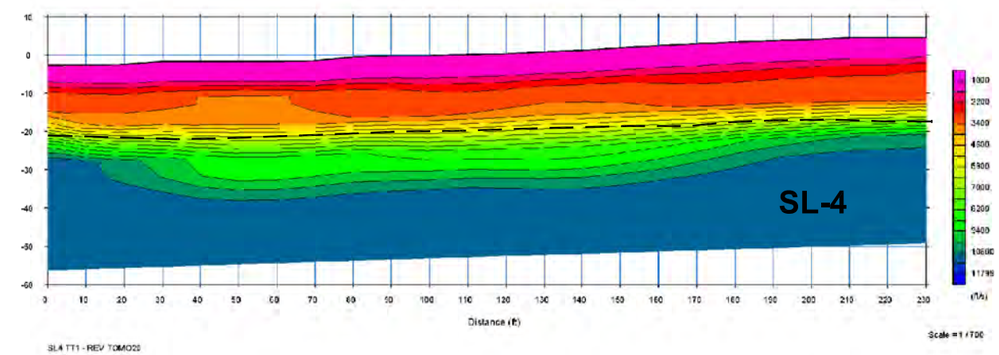
DATE: Feb 9, 2017 | DRAWN BY: R. SMITH

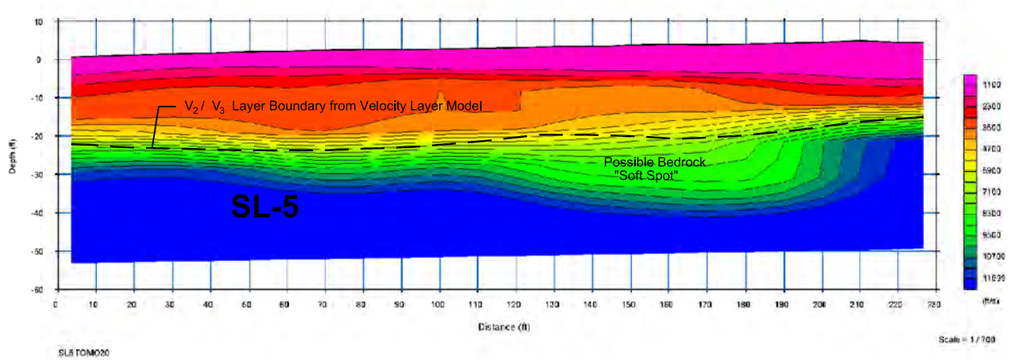
FIGURE 5

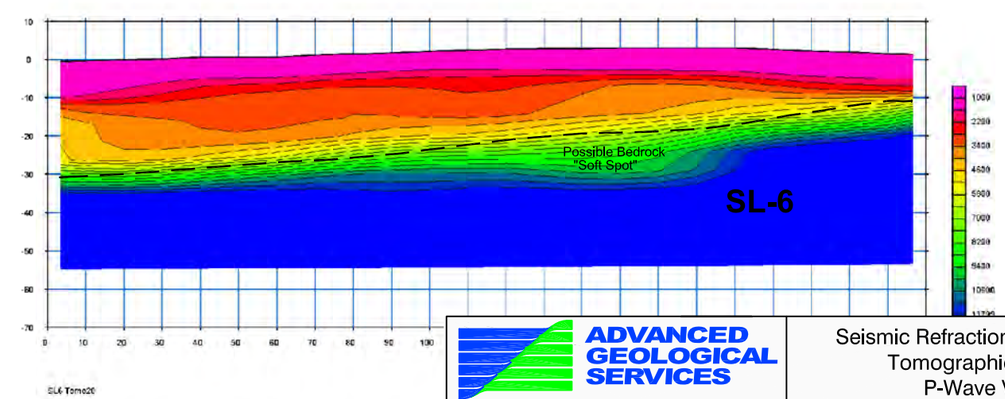












ADVANCED GEOLOGICAL SERVICES

1605 School Street
Suite 4
Moraga, CA 94556
(925) 808-8965

Seismic Refraction Survey Results-
Tomographic Models of
P-Wave Velocity

LOCATION: Loomis, California

CLIENT: Kleinfelder, Inc.

PROJECT #: 16-139-1CA

DATE: Feb 9, 2017 | DRAWN BY: R. SMITH

FIGURE 6

APPENDIX A

SEISMIC VELOCITY AND LIMITATIONS OF THE REFRACTION METHOD

The physical properties of earth materials (fill, sediment, rock) such as compaction, density, hardness, and induration dictate the corresponding seismic velocity of the material. Additionally, other factors such as bedding, fracturing, weathering, and saturation can also affect seismic velocity. In general, low velocities indicate loose soil, poorly compacted fill material, poorly to semi-consolidated sediments, deeply weathered, and highly fractured rock. Conversely, high velocities are indicative of competent rock or dense and highly compacted sediments and fill. The highest velocities are measured in unweathered and little fractured rock.

There are certain limitations associated with the seismic refraction method as applied for this investigation. These limitations are primarily based on assumptions that are made by the data analysis routine. The data analysis routine assumes that the velocities along the length of each spread are uniform. If there are localized zones within each layer where the velocities are higher or lower than indicated, the analysis routine will interpret these zones as changes in the surface topography of the underlying layer. A zone of higher velocity material would be interpreted as a low in the surface of the underlying layer. Zones of lower velocity material would be interpreted as a high in the underlying layer. The data analysis routine also assumes that the velocity of subsurface materials increase with depth. Therefore, if a layer exhibits velocities that are slower than those of the material above it, the slower layer will not be resolved. Also, a velocity layer may simply be too thin to be detected.

The quality of the field data is critical to the construction of an accurate depth and velocity profile. Strong, clear “first-break” information from refracted interfaces will make the data processing, analysis, and interpretation much more accurate and meaningful. Vibrational noise or poor subsurface conditions can decrease the ability to accurately locate and pick seismic waves from the interfaces.

Due to these and other limitations inherent to the seismic refraction method, resultant velocity cross-sections should be considered only as approximations of the subsurface conditions. The actual conditions may vary locally.

Appendix H Environmental Site Assessments

Phase I Environmental Site Assessment

March 15, 2017
Kleinfelder Project No. 20172062.001A

Costco Wholesale
9 Corporate Park, Suite 230
Irvine, California 92606

Attention: Michael Okuma, NCARB
Director of Real Estate Development

SUBJECT: Phase I Environmental Site Assessment
Proposed Costco Wholesale Warehouse and Fuel Facility
Southeast Corner of Brace Road and
Sierra College Boulevard
Loomis, California
CW#: 16-0132

Dear Mr. Okuma:

Enclosed is the Phase I Environmental Site Assessment (ESA) report for the above-referenced property. We trust the information presented in this report meets your needs at this time.

An executive summary is provided. However, we recommend that the report be read in its entirety for a comprehensive understanding of the items contained therein.

We appreciate the opportunity to provide these services to Costco Wholesale. If you have questions regarding this report or if we can be of further service, please do not hesitate to contact Paolo Dizon at 949.727.4466 or Andy Franks, Kleinfelder's Client Account Manager for Costco, at 480.650.4905.

Sincerely,

KLEINFELDER, INC.

Paolo Dizon
Project Manager

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PHASE I ENVIRONMENTAL SITE ASSESSMENT PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD LOOMIS, CALIFORNIA CW#: 16-0132 KLEINFELDER PROJECT NO. 20172062.001A

MARCH 15, 2017

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ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC PROJECT FOR WHICH THIS REPORT WAS PREPARED.

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A Report Prepared for:

Costco Wholesale
9 Corporate Park, Suite 230
Irvine, California 92606

PHASE I ENVIRONMENTAL SITE ASSESSMENT
PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SOUTHEAST CORNER OF BRACE ROAD
AND SIERRA COLLEGE BOULEVARD
LOOMIS, CALIFORNIA
CW#: 16-0132

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March 15, 2017
Kleinfelder Project No. 20172062.001A

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1 EXECUTIVE SUMMARY

This report documents a Phase I Environmental Site Assessment (ESA) performed by Kleinfelder, Inc. (Kleinfelder) for Costco Wholesale Corporation (Costco / Client), of the proposed location of a Costco Wholesale Warehouse and Fuel Facility (collectively referred to as the "Site"). The Site is located at the southeast corner of Brace Road and Sierra College Boulevard in the Town of Loomis, Placer County, California (see Figure 1, Site Location Map). Kleinfelder understands the Client has requested a Phase I ESA be performed prior to purchasing and developing the Site.

This report was prepared using the ASTM International (ASTM, formerly known as the American Society for Testing and Materials) Designation E 1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (the "Standard Practice"), the All Appropriate Inquiry (AAI) section of the Small Business Liability Relief and Revitalization Act (the Federal Brownfields Law), and Costco's Development Requirements, Version 2014, revised June 13, 2014. The Phase I ESA findings include the following:

- The Site totals 17.2 acres and is vacant land, located at the southeast corner of the intersection of Brace Road and Sierra College Boulevard. The Site is designated by Placer County Assessor Parcel Numbers (APNs) 045-042-034-000, 045-042-035-000, 045-042-036-000, and a portion of 045-042-037-000. APN 045-042-034-000 is the largest of the four parcels, and consists of 6.90 acres.
- Most of the Site was historically developed as orchards from at least 1938 until sometime between 1954 and 1966. Dirt roads were present at the Site as early as 1938. A structure associated with a residential building located off-Site to the north was present on the northern Site boundary in 1938. A second structure (unknown purpose) was present in the center of the Site from at least 1938 until prior to 1952, and a third structure (unknown purpose) was present on the eastern side of the Site between 1966 and 2009. A well and a pole-mounted transformer were located on the eastern side of the Site adjoining the remains of the former eastern structure. Although the use of the structures is not known, the potential exists that they may have been associated with agricultural operations and storage of equipment and/or chemicals.
- A rectangular feature was visible in aerial photographs near the south end of a dirt road (Starlight Lane), extending in an east-west direction toward the eastern Site boundary from at least 1966 through 1993. A small structure was observed in the area between the road and the feature. It is not clear what this feature is, but an area of disturbed ground was noted in the general vicinity during the Site reconnaissance.

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- A gate was observed in the fencing that marked the boundary of the Site and the residences to the east, at the southeastern portion of the Site. Piles of wood, wooden pallets, fencing, dirt, brush and other debris were observed adjacent to the gate on Site. This location appears to be used as a storage/disposal area by the adjoining resident. Hazardous materials were not observed in the debris pile.
- A gasoline station with underground storage tanks (USTs) has operated since approximately 1999 on the adjacent property south of the Site. The gasoline station property is believed to be hydrogeologically cross-gradient to potentially up-gradient relative to the Site. Groundwater in the vicinity has been reported at depths as shallow as 2 feet below ground surface (bgs). No releases at the gasoline station have been reported.

In summary, the following RECs were noted for the Site:

- The former orchard use of the Site, and associated structures that may been used for storage of equipment and/or chemicals. Orchards typically utilize smudge pots which use petroleum hydrocarbons to reduce the potential for freezing, and also may have been routinely treated with pesticides (such as lead arsenate) and other chemicals, which may remain in the Site soils. Also, according to Placer County Environmental Health, lead and arsenic are contaminants commonly found at former orchards in Placer County.
- The gasoline station adjoining the Site, which has operated for approximately 18 years. Although no releases have been reported at the gasoline station, its operation for almost two decades increases the likelihood that undetected spills or leakage have occurred during operations, resulting in impacts to the shallow groundwater. Based on the gasoline station's potentially up-gradient location relative to the Site, impacted groundwater beneath the gasoline station may make its way towards and beneath the Site.

Although not a REC, in Kleinfelder's opinion, the location of the former rectangular feature of unknown use at the east central portion of the Site warrants further investigation.

Based on the findings and conclusions of this Phase I ESA, Kleinfelder has the following recommendations for further assessment:

- Shallow soils across the Site may have been impacted with residual pesticides and petroleum hydrocarbons from historical orchard operations. However, in order to confirm this conclusion and further define Costco's risk, it would be necessary to perform sampling and analysis of the surficial soils.
- Based on proximity of the adjoining service station, conducting baseline subsurface sampling is recommended at the location of the proposed Costco fueling facility.

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- Based on the unknown use of the former rectangular feature observed in the aerial photographs, Costco should sample soils at this location to assess for contaminants in the subsurface.
- Debris and stored material along the eastern portion of the Site should be removed prior to construction.
- Prior to Site development, the domestic groundwater well located on the eastern side of the Site should be properly abandoned per state and county standards.

In addition to these conditions, deviations from the Phase I ESA Standard (if any) are discussed in Section 8 of this report. This report is subject to the limitations in Section 2.5.

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2 INTRODUCTION

This report is a summary of work performed using the guidelines set forth in the Standard Practice, and as set forth in Costco's Development Requirements, Version 2014, revised June 13, 2014. This report also generally conforms to the Standard Practice's suggested table of contents. Minor format modifications have been made to the Standard Practice's suggested table of contents to assist in better reading and understanding the report findings.

2.1 PURPOSE

The purpose of this Phase I ESA is to identify, to the extent feasible pursuant to the scope of services defined in our Proposal Number (No.) MPCOSTCO.001C/IRV16P45931, dated August 29, 2016, the scope defined in the Standard Practice, and limitations discussed in this report, RECs Standard Practice and limitations discussed in this report, RECs and other environmental issues related to the Site.

As defined in the Standard Practice, an REC is:

> *"The presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to a release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions."*

As defined in the Standard Practice, a de minimis condition is:

> *"A condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."*

The 2013 Standard Practice also introduced the designation of CREC. As defined in the Standard Practice, a CREC is:

> *"… a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)."*

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The 2013 Standard Practice defines a historical REC (HREC) as:

> *"…a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to environmental controls."*

The final decision regarding whether a past release is an HREC rests with the environmental professional (EP), and will be influenced by the current impact (if any) of the past release to the Site.

This report describes Kleinfelder's assessment methodology and documents its findings, subject to the limitations presented in Section 2.5 of this report.

2.2 DETAILED SCOPE OF SERVICES

The following sections describe Kleinfelder's work scope:

- Section 2, **Introduction**, includes a discussion of the purpose/reason for performing the Phase I ESA, additional services requested by the Client (e.g., an evaluation of business environmental risk factors associated with the Site), significant assumptions (e.g., property boundaries if not marked in the field), limitations, exceptions, special terms and conditions (e.g., contractual), and user reliance parameters.
- Section 3, **Site Description**, is a compilation of information concerning the Site location, legal description (if provided by the Client), current and proposed use of the Site, a description of structures and improvements on the Site at the time of Kleinfelder's assessment, and adjoining property use.
- Section 4, **Records Review**, is a compilation of Kleinfelder's review of several databases available from Federal, State, and local regulatory agencies regarding hazardous substance use, storage, or disposal at the Site; and for off-Site facilities within the search distances specified by the Standard Practice. Records provided by the Client are summarized, and copies of relevant documents are included in the appendices of this report. Physical setting sources (including topography and soil and groundwater conditions) and typical Client-provided information (e.g., title records, environmental liens, specialized knowledge, valuation reduction for environmental issues, and owner, property manager, and occupant information) are also summarized. Other interviews with people knowledgeable about the Site (including the Client) are included in Section 7.

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- Section 5, **History of the Site**, summarizes the history of the Site and adjoining properties. This Site history is based on various sources, which may include a review of historical aerial photographs, Sanborn Fire Insurance Maps, city or suburban directories, historical topographic maps, building department records, and results of previous Site assessments (if any and reasonably ascertainable).
- Section 6, **Site Reconnaissance**, describes Kleinfelder's observations during the Site reconnaissance. The methodology used and limiting conditions are also described.
- Section 7, **Interviews**, is a summary of telephone and personal interviews performed with "Key Site Managers" that may include the Site owner/manager, occupants/tenants, local government officials, and the Client. Additional interview sources may be contacted if Key Site Managers were not available prior to production of this report, and may include adjoining landowners and people with historical knowledge of the area.
- Section 8, **Evaluation**, is a presentation of findings and opinions regarding the information provided in Sections 3 through 7, and presents the conclusions regarding the presence of RECs connected with the Site, and Kleinfelder's recommendations.
- Section 9, **References**, is a summary listing of the resources used to compile this report.

A statement of qualifications of the signatories of this report is provided in Appendix A of this report, and pertinent documentation regarding the Property is included in Appendices B through E.

2.3 ADDITIONAL SERVICES

Kleinfelder's scope of services did not include Standard Practice non-scope evaluations of cultural, historic, and archaeological resources; and environmental regulatory compliance that may be required for a Phase I ESA pursuant to Costco's Development Requirements publication (revised June 13, 2014). In addition, the Phase I ESA did not include an assessment for asbestos containing materials (ACMs), radon, lead-based paint (LBP), lead in drinking water, molds and mildews, indoor air quality, industrial hygiene, health and safety, wetlands, and other Standard Practice non-scope considerations not described herein. At the request of the Client, a wetlands survey was not included as part of the scope of services for this Phase I ESA.

The Phase I ESA included an evaluation of threatened, endangered, and other protected species that are required for a Phase I ESA pursuant to Costco's Development Requirements (Appendix E). No other additional services were provided by Kleinfelder for this Phase I ESA.

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2.4 SIGNIFICANT ASSUMPTIONS

Kleinfelder does not guarantee the accuracy of information supplied by its sources, but reserves the right to rely on the information in forming a professional opinion regarding the potential for contamination at the Site. It is assumed the Client provided Kleinfelder all applicable and available environmental records and specialized knowledge in its possession regarding the Site. Kleinfelder has not made other significant assumptions during the performance of this Phase I ESA.

2.5 LIMITATIONS AND EXCEPTIONS

Phase I ESAs are non-comprehensive by nature and may not identify all environmental problems, and will not eliminate all risk. This report is a qualitative assessment. Kleinfelder offers a range of investigative and engineering services to suit the needs of its clients, including more quantitative investigations. Although risk can never be eliminated, more detailed and extensive investigations yield more information, which may help the Client understand and better manage risks. Since such detailed services involve greater expense, Kleinfelder asks its clients to participate in identifying the level of service that will provide them with an acceptable level of risk. Please contact the signatories of this report if you would like to discuss this issue of risk further.

Kleinfelder performed this Phase I ESA consistent with the guidelines set forth in the Standard Practice; Costco's Development Requirements, Version 2014 (revised June 13, 2014); and the proposed scope of services subsequently approved by Costco. No other warranty, either express or implied, is made. Environmental issues not specifically addressed in this report were beyond the scope of Kleinfelder's services and not included in the evaluation.

This report may be used only by Costco and only for the purposes stated within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land or facility use, on- and off-Site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Since Site activities and regulations beyond Kleinfelder's control may change at any time after the completion of this report, the observations, findings, and opinions provided herein are considered valid only as of the date of the Site visit. Pursuant to Section 4.6 of the Standard Practice, this report should not be relied upon after 180 days from the date of its oldest component. The Phase I ESA has been conducted in accordance with and conforms to the Costco Wholesale Development Requirements Document and the latest edition of ASTM E 1527. This assessment has been prepared for the sole use of Costco Wholesale Corporation. Its contents should not be used or relied upon by other parties without the express written consent of Costco and Kleinfelder. Based on the intended use of the report,

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Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party, but only to the extent of any such non-compliance by the Client.

2.6 SPECIAL TERMS AND CONDITIONS

No special terms and conditions were agreed to by the Client and Kleinfelder.

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3 SITE DESCRIPTION

The Site description is presented in this section and describes the condition of the Site at the time of the Phase I ESA. The Site location is shown on Figure 1. Tables 3-1 through 3-4 summarize the physical characteristics of the Site and adjoining properties.

3.1 LOCATION AND LEGAL DESCRIPTION

The information presented in Table 3-1 denotes the physical location and legal description of the Site. This information was obtained from review of various maps (such as topographic maps and tax assessor maps), aerial photographs, public records at City and/or County offices, interviews, and/or information provided by the Client.

TABLE 3-1
Location and Legal Description

PARAMETER	INFORMATION/COMMENTS
LOCATION	The Site is located at the southeast corner of the intersection of Brace Road and Sierra College Boulevard in the Town of Loomis, Placer County, California (see Figure 1 – Site Location Map and Figure 2 – Site Vicinity Aerial Photograph).
LEGAL DESCRIPTION	The legal description of the Site is presented in the Environmental Data Resources, Inc. (EDR), EDR Environmental Lien and AUL Search report (EDR, 2016a) provided in Appendix C.
ASSESSOR'S PARCEL NUMBER / ADDRESSES	The following APNs are associated with the Site: 045-042-034-000 (No street address) 045-042-035-000 (No street address) 045-042-037-000 (No street address) A portion of 045-042-036-000 (No street address)
SECTION, TOWNSHIP, AND RANGE	Township 11 North, Range 7 East, Section 16, Mount Diablo Base Meridian.

3.2 CURRENT / PROPOSED USE OF THE PROPERTY

At the time of Kleinfelder's assessment, the Site was vacant. Current and proposed Site uses are described in Table 3-2.

TABLE 3-2
Current and Proposed Uses

PARAMETER	GENERAL OBSERVATIONS
CURRENT USE	Vacant
PROPOSED USE	Costco Wholesale Warehouse and Fuel Facility

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3.3 DESCRIPTION OF STRUCTURES / IMPROVEMENTS

Structures and/or improvements observed on the Site at the time of Kleinfelder's reconnaissance are described in Table 3-3.

TABLE 3-3
Structures and Improvements

PARAMETER	GENERAL OBSERVATIONS
STRUCTURES	No structures are located on the Site.
IMPROVEMENTS	One domestic well and a pole-mounted transformer were observed in the eastern portion of the Site. Storm drains were observed near the boundaries of the Site.

3.4 CURRENT USES OF ADJOINING PROPERTIES

Kleinfelder performed a brief drive-by survey of the properties immediately adjoining to the Site on September 19 2016. A summary of the observations regarding the surrounding properties is presented in Table 3-4 and shown on Figure 2, Site Vicinity Aerial Photograph.

TABLE 3-4
Adjoining Properties

DIRECTION	LAND USE DESCRIPTION
NORTH	Residential area and Brace Road, beyond which is a retail lumber yard and a residential area.
EAST	Residential area.
SOUTH; SOUTHWEST	Vacant land, Chevron Station and McDonald's restaurant.
WEST	Sierra College Boulevard, beyond which are an office building and vacant land.

Hazardous materials and petroleum products were not observed to be stored on the properties adjoining to the Site, other than petroleum products associated with the adjoining gasoline service station. No other indications of obvious or suspect RECs were apparent on the adjoining properties at the time of Kleinfelder's Site reconnaissance.

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4 RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

The purpose of the records review is to obtain and review records that would help to evaluate RECs in connection with the Site and bordering properties. Federal, State, and local regulatory agencies publish databases or "lists" of businesses and properties that handle hazardous materials or hazardous waste, or are the known location of a release of hazardous substances to soil and/or groundwater. These databases are available for review and/or purchase at the regulatory agencies, or the information may be obtained through a commercial database service. Kleinfelder contracted a commercial database service, EDR, of Shelton, Connecticut, to perform the government database search for listings within the appropriate Standard Practice minimum search distance of the Site, and the distances set forth in Costco's Development Requirements, Version 2014, revised June 13, 2014. Kleinfelder provided EDR with a Site map to incorporate the search distances from the Site boundary. Included in the EDR Radius Map™ Report with GeoCheck® (EDR, 2016b) is a listing of specific databases outlined by the Standard Practice. A listing of the search distances, databases evaluated, dates the databases were last updated, and types of information contained in each database are included in the regulatory database search report provided in Appendix B of this report.

EDR utilizes a geographical information system to plot the locations of reported spills, leaks, incidents, etc. Kleinfelder reviews this information to help establish if the Site or nearby properties are listed in the databases and lists. Each of the listings was reviewed by Kleinfelder to assess whether the corresponding property details included in EDR's report revealed a potential environmental impact to the Site. Many listings in the report were concluded not to have the potential to impact the Site based on the following, or a combination thereof:

- The listed property is located at a distance where the facility is unlikely to impact the Site based on Kleinfelder's evaluation of the relevant data in EDR's report and knowledge of the Site vicinity.
- The listed property is located in a down-gradient or cross-gradient direction from the Site, based on the anticipated direction of groundwater flow at the property being evaluated, and is located at a distance such that it is unlikely to impact the Site. Note that the groundwater flow direction is estimated to be predominantly to the northwest based on review of available information (although it has been reported to the north in nearby

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facilities), and judgements as to down- or cross-gradient direction are best made if groundwater flow direction information is available for a specific property.

- The listed property is identified in the underground storage tank (UST) or Small Quantity Generator (SQG) databases and does not immediately adjoin the Site. The property is furthermore not listed in other databases that report a release of a hazardous substance or petroleum product and/or is not listed as having environmental violations. The listing of a facility in these databases alone is not indicative of an unauthorized release.
- The listing for the facility suggested a short-term release occurred (e.g., from incidental traffic accidents or involving limited quantities of chemicals from illegal drug labs found at residences), with associated response actions completed.
- The quantity of the hazardous substances or petroleum product released from an off-Site, non-adjoining facility was not judged to have resulted in contamination above the most stringent criteria requiring regulatory action. Therefore, no impact to the Site is anticipated.
- The listed property record indicates that the property was characterized, the reported release affected soil only, the listed property was not on or adjacent to the Site, and the release was not recognized as indicative of area-wide conditions or was characterized as a soil removal action only.
- The listed property record indicates that contamination on the property is limited to relatively non-mobile contaminants, including polyaromatic hydrocarbons (PAHs) and metals, in soil only, on a non-adjacent property.
- The listed property record indicates that the case for the property has been closed to the satisfaction of the designated lead regulatory agency, and residual contamination, if present, is not considered likely to affect the Site based on one or more of the criteria mentioned in the bulleted items above (a condition referred to by the Standard Practice as an HREC).

Based on these criteria indicating no material threat of a release that affected the Site and/or no release that could require future regulatory agency oversight, the listings concluded not to have the potential to impact the Site were not evaluated further and are not discussed in the following sections.

4.2 RESULTS OF DATABASE SEARCH

The remaining property listings were reviewed to assess whether these properties had environmental releases that may have resulted in RECs in relation to the Site. If the listed

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properties had a reported release which may have resulted in an REC, the property was further assessed by performing a review of agency files available via the GeoTracker™ website (http://geotracker.waterboards.ca.gov/) of the State Water Resources Control Board (SWRCB) and/or other relevant regulatory agency websites to evaluate whether the listed release represents a potential impact to the Site.

4.2.1 Site Listings

The Site was not listed in databases searched by EDR.

4.2.2 Off-Site Listings

Certain off-Site properties were listed in standard Federal, State, and local lists within the Standard Practice search distances and the distances set forth in Costco's Development Requirements, Version 2014, revised June 13, 2014. Kleinfelder reviewed the listing information to assess the potential for impacts to soil, soil vapor, and groundwater beneath the Site. One off-Site property was found within the search distances and in an estimated hydrogeologically up-gradient direction to the Site which appears to have the potential to impact the Site.

One off-Site property listed is adjacent to the Site to the south (cross-gradient to potentially upgradient). This property is addressed as 4211 Sierra College Boulevard, and has been listed as a Chevron gasoline station since at least 1999. Identified in the EDR report as Chevron Station No 2, Chevron USA-Sierra, and Chevron-Rocklin, the facility is listed in the following databases: Resource Conservation and Recovery Act Small Quantity Generator (RCRA-SQG), Facility Index System/Facility Registry System (FINDS), Hazardous Waste Facility and Manifest Data (HAZNET), Enforcement & Compliance History Information (ECHO), Emissions Inventory Data (EMI), Placer County Master List of Facilities (CA PLACER CO. MS), UST, and EDR's Exclusive Historic Gas Stations (Hist Auto). Based on current aerial photographs, this property appears to have three USTs. No releases are indicated in the database report. These listings alone are not indicative of a REC to the Site.

4.2.3 Orphan List

Facilities not plotted by EDR due to poor or inadequate address information are referred to as orphan sites. Five unmapped orphan sites are listed in the EDR report. The orphan summary/unmapped site report was reviewed to assess the potential for listed facilities to pose a REC to the Site. Based on our review, these listings were assessed not to pose an environmental concern to the Site.

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4.3 OTHER RECORDS REVIEWED / AGENCIES CONTACTED

The following additional sources of environmental records were reviewed during this Phase I ESA for the purposes of meeting the Standard Practice. Local regulatory agencies were contacted for reasonably ascertainable and practically reviewable documentation regarding RECs present at the Site and adjoining facilities. Summaries of interviews with local regulatory agency representatives, when performed, are included in Section 7 of this report (with interview documentation included in Appendix C). The following agencies (if marked with an "X") were contacted for documentation:

- ☒ Placer County Environmental Health Department (EHD)
- ☒ Placer County Recorder-Clerk
- ☒ Loomis Fire Prevention District
- ☒ Town of Loomis Building Department
- ☒ Placer County Community Development, Building and Planning Services Divisions
- ☒ State Water Resources Control Board (SWRCB) / GeoTracker™ Database
- ☒ Pipeline and Hazardous Materials Safety Administration (PHMSA), National Pipeline Mapping System (NPMS)
- ☒ State Department of Toxic Substances Control (DTSC) / EnviroStor Database
- ☒ Placer County Air Pollution Control District (PCAPCD)

Information obtained from these agencies is summarized below.

4.3.1 Placer County Environmental Health Department

Kleinfelder searched the Placer County Electronic Document Center on September 8, 2016 for Environmental Health Department documents recorded under the parcel numbers associated with the Site, and for the parcel associated with the adjacent Chevron gasoline station located south of the Site at address 4211 Sierra College Boulevard. Kleinfelder also submitted a written request to the EHD on September 8, 2016 for information pertaining to hazardous materials usage and storage, including AST and UST records, for the parcel numbers associated with the Site. A response from the EHD was received on September 9, 2016, which confirmed that the documents available in the Electronic Document Center were the only files available for the Site. A summary of the available files is provided as follows:

- Documentation of an email conversation and records search for the Site parcels conducted in 2009. The conversation began with a query to the Environmental Health Department, in which someone recalled that in 1990 or 1991 the parcels were determined to be underlain by three contaminated groundwater aquifers. At the time of the query, the

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Town of Loomis was considering the parcels as a potential location for affordable housing. Environmental Health reviewed the files for the parcels and found no records related to groundwater contamination. EHD noted that three former USTs were located south of the parcels and were closed by the Central Valley Regional Water Quality Control Board as low risk sites. These appear to be related to a former Chevron station that was previously located at 4365 Sierra College Boulevard, approximately 750 feet south of the Site (EDR, 2016b).

- An Environmental Review Application was submitted in April 1989 by Sunrise Marketing Group and Frontier Land Development Company for proposed development and rezoning of the Site.

Copies of the EHD files are included in Appendix C.

4.3.2 Placer County Recorder-Clerk

Kleinfelder reviewed files for the Site at the Placer County Recorder-Clerk's office, on September 19, 2016. The following documents were available:

- An easement recorded August 11, 1987 between Donald Tanklage and Loomis Town for ditch digging. The location was described as the northwest quarter of Section 16, Township 11 North, Range 7 East, which encompasses the Site.
- A grant deed was recorded February 25, 1994 from Rob Douglas to Carole and Don Tanklage for APNs 045-042-036 and -037.
- A survey map was recorded May 2, 1994 for Donald Tanklage for property described as Township 11 North, Range 07 East, Section 16, which encompasses the Site.
- A quit claim deed was recorded from Donald Tanklage and Carole Tanklage (individuals) to the Donald Tanklage and Carole Tanklage Foundation. The property was described as Lots 25 and 26 of the Himes Tract, at the intersection of Himes and Brace Roads, and included the Site.

4.3.3 Loomis Fire Prevention District

Kleinfelder contacted the Loomis Fire Prevention District on September 8, 2016 for documents recorded under the parcel numbers associated with the Site. The District responded on September 13, 2016 with the information that they do not have records for properties without structures.

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4.3.4 Town of Loomis Building Department

Kleinfelder submitted a request via email to the Town Building Inspector on September 8, 2016 regarding available records of improvements for the parcel numbers associated with the Site. On September 13, 2016, the Town Building Inspector responded there are no building files for the parcel numbers associated with the Site.

4.3.5 Placer County Community Development, Building and Planning Services Divisions

Kleinfelder searched the Placer County Electronic Document Center on September 8, 2016 for Building Services Division and Planning Services Division documents recorded under the parcel numbers associated with the Site. No documents were found. A request for records was also submitted to the Building Services and Planning Services Division on September 10, 2016. Responses were received from both Divisions on September 12, 2016, which stated that the Site is under the jurisdiction of the Town instead of the County.

4.3.6 State Water Resources Control Board / GeoTracker™ Database

Kleinfelder reviewed the SWRCB GeoTracker™ website (http://geotracker.waterboards.ca.gov/) on September 8, 2016 for information associated with releases of hazardous materials or substances at the Site. No listings were reported to be associated with the Site. Four off-Site listings were found within approximately one-quarter mile of the Site.

A closed leaking UST (LUST) case was listed for the 7-Eleven Store, located approximately 450 feet south of the Site at 4281 Sierra College Boulevard. Groundwater beneath this facility was impacted with gasoline constituents. Based on information from groundwater monitoring conducted during Third Quarter 2007, groundwater was encountered at depths of 5 to 8 feet below ground surface (bgs) and flowed to the northwest (SECOR International Incorporated [SECOR], 2007). Gasoline constituents were not detected in nearest wells to the Site (MW-6 and MW-7). The 7-Eleven facility was granted No Further Action by the California Regional Water Quality Control Board – Central Valley Region (CVRWQCB) in June 2008, and is not considered a REC likely to affect soil, soil vapor or groundwater beneath the Site.

A closed LUST case was listed for Shamrock Pump & Equipment, located approximately 700 feet northwest of the Site. Groundwater beneath this facility was impacted with gasoline and fuel constituents. Based on the most recent groundwater monitoring event performed in October 2001 for this facility, groundwater was encountered at approximately two to seven feet below ground surface, and groundwater flow direction was reported to have fluctuated from southeast to northwest (CVRWQCB, 2002). The nearest domestic groundwater well was sampled, with

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analytical results below laboratory detection limits. No Further Action was granted in May 2002 (CVRWQCB, 2002). Based on the direction of this facility from the Site, groundwater sampling results, and case closure, this facility is not considered a REC likely to affect soil, soil vapor or groundwater beneath the Site.

A closed LUST case was listed for former Chevron #9-6705, located at 4365 Sierra College Boulevard, approximately 750 feet south of the Site. Other than the receipt of a No Further Action letter from the CVRWQCB in 2004 (CVRWQCB, 2004), no additional information was available in GeoTracker™.

A closed LUST case was listed for the former Unocal SS#6008, located at 4390 Sierra College Boulevard, approximately 1,500 feet south of the Site. Groundwater beneath this facility was impacted with gasoline constituents. Based on information from groundwater monitoring conducted during October 2006, groundwater was encountered at depths of 8 to 19 feet bgs and flowed to the northwest (TRC, 2006). Historically, groundwater at the former Unocal facility ranged from depths of 2 to 21 feet bgs, with groundwater flow directions ranging from northwest to north (TRC, 2005). No Further Action was granted in February 2007 (CVRWQCB, 2007). Based on the distance of this facility from the Site, most recent groundwater sampling results, and case closure, this facility is not considered a REC likely to affect soil, soil vapor or groundwater beneath the Site.

4.3.7 Pipeline and Hazardous Materials Safety Administration, National Pipeline Mapping System

Pipeline information is available at the PHMSA's online NPMS website (https://www.npms.phmsa.dot.gov). Kleinfelder researched pipeline information on the website on September 8, 2016 for the Site. Based on Kleinfelder's review of the NPMS website, no mapped natural gas transmission pipelines or hazardous liquid pipelines are located on Site, or on properties that adjoin the Site. One active natural gas transmission pipeline owned by Pacific Gas & Electric Company is located approximately 600 feet northwest of the Site, and runs along the east side of Taylor Road. One active hazardous liquids pipeline managed by Kinder Morgan is located approximately 840 feet northwest of the Site, and run along the west side of the Union Pacific railroad tracks. This pipeline is listed as containing non-highly volatile liquid products. A copy of the NPMS map is included in Appendix C.

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4.3.8 State Department of Toxic Substances Control / EnviroStor

Kleinfelder reviewed the DTSC EnviroStor website (http://www.envirostor.dtsc.ca.gov/) on September 10, 2016 for information pertaining to the Site. Based on Kleinfelder's review of the website, no listings were found pertaining to the Site or for properties immediately adjoining to the Site.

4.3.9 Placer County Air Pollution Control District

Kleinfelder submitted a written request to the APCD on September 10, 2016 for permits for the parcel numbers associated with the Site. On October 19, 2016, Kleinfelder received an email response from Mr. Zach Lee of Placer County APCD indicating that they had no records pertaining to the Site.

4.4 PHYSICAL SETTING SOURCE(S)

Table 4-1 presents information concerning the physical setting of the Site. The information was primarily obtained from published maps.

TABLE 4-1
Physical Setting

DATA	GENERAL INFORMATION
USGS TOPOGRAPHIC QUADRANGLE	Based on the United States Geological Survey (USGS), Rocklin, CA Quadrangle 7.5-Minute Series (Topographic) Map, dated 2012, the Site elevation is shown between approximately 330 and 340 feet above Mean Sea Level (MSL). Topography in the vicinity of the Site is shown as sloping down to the west and southwest (EDR, 2016b).
SOIL TYPE	The Site is underlain by *Andregg* coarse sandy loam (EDR, 2016b).
OIL AND GAS WELLS	Information concerning oil and gas fields was obtained by Kleinfelder from published maps available for download on the Division of Oil, Gas, and Geothermal Resources (DOGGR)'s internet web site (http://maps. conservation.ca.gov/doggr/index.html). Kleinfelder researched oil well information on the DOGGR website on September 10, 2016 for the Site and Site vicinity. Based on Kleinfelder's review, no oil wells are located on the Site or in the immediate Site vicinity.

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Table 4-2 presents information concerning regional geology and hydrogeology. The information was obtained from published maps and other sources.

TABLE 4-2
Regional Geology and Hydrogeology

PHYSICAL PARAMETER	INFORMATION/COMMENTS
REGIONAL PHYSIOGRAPHY AND GEOLOGY	The Site is located in the Town of Loomis, which is located in the Sacramento Valley portion of the Great Valley geomorphic province, which consists of an alluvial plain drained by the Sacramento River. The Great Valley is a trough between the surrounding mountain ranges in which sediments have accumulated since the Jurassic Age (California Department of Conservation, California Geological Survey [CGS], 2002; USGS, 1966).
REGIONAL HYDROGEOLOGY	The Site is located outside of any named groundwater basins. (California Department of Water Resources [CDWR], 2004).
DEPTH TO GROUNDWATER DIRECTION OF ANTICIPATED FLOW [1]	Based on review of available groundwater information from nearby facilities located within approximately 0.25-mile of the Site, groundwater was encountered at depths historically ranging from approximately 2 to 21 feet bgs, with a predominantly northwest flow direction (TRC, 2007; SECOR,2007); however, groundwater was observed to also flow to the southeast (CRWQCB, 2002) and to the north (TRC, 2005). A groundwater elevation contour map for the adjacent North American Groundwater Sub-basin showed a regional groundwater flow direction to the southwest in Spring 2005 (MWH, 2007).
REGIONAL GROUNDWATER QUALITY PROBLEMS	A review of the groundwater principal contamination sites described for the adjacent North American Groundwater Sub-basin revealed that the nearest site is more than four miles from, and downgradient from, the Site (MWH, 2007).
WATER SUPPLY	The well search performed by EDR indicated no private or public water supply wells are located on or adjacent to the Site (EDR, 2016b). However, one groundwater well was observed in the eastern portion of the Site during the Site reconnaissance.
FLOOD ZONE DESIGNATION	According to The EDR Radius Map™ Report with GeoCheck®, the Site is not located within a 100-year or 500-year flood zone (EDR, 2016b).

[1] Groundwater flow direction is based on regional information sources. Site-specific conditions may vary due to a variety of factors including geologic anomalies, utilities, nearby pumping wells (if present), and others.

4.5 USER PROVIDED INFORMATION

According to the Client, the purpose for performing this Phase I ESA is to evaluate the potential for RECs at the Site for the purpose of constructing a new Costco Warehouse and fuel facility. Information regarding the current owners/occupants of the Site is summarized in Table 4-3.

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TABLE 4-3
Owner and Occupant Information

ENTITY	NAME
OWNER	Based on the EDR Environmental Lien and AUL Search (EDR, 2016a), the Site parcels and current owners are as follows: 045-042-034-000 – Donald B & Carole F Tanklage Foundation 045-042-035-000 - Donald B & Carole F Tanklage Foundation 045-042-036-000 - Donald B & Carole F Tanklage Foundation 045-042-037-000 - Donald B & Carole F Tanklage Foundation
OCCUPANT(S)	Not occupied.

Summaries of interviews of key individuals with knowledge of the Site ("Key Site Managers") are provided in Section 7. The following sections present information provided to Kleinfelder by the Client.

4.6 TITLE RECORDS

Chain-of-title information was not provided by the Client. Therefore, a review of a chain-of-title report was not reviewed as part of this Phase I ESA.

4.7 ENVIRONMENTAL LIENS AND USAGE LIMITATIONS

According to information provided in EDR's regulatory agency database search report (EDR, 2016b), there are no liens pertaining to the Site listed in the Federal superfund liens list maintained by the United States Environmental Protection Agency (US EPA), nor known recorded land-use environmental deed restrictions pertaining to the Site listed in the State Liens Database. Kleinfelder's review of the *EDR Environmental Lien and AUL Search* report (EDR, 2016a) for the Site indicates there are no environmental liens or activity and use limitations (AULs) associated with the Site.

4.8 VALUE REDUCTION

As part of the Standard Practice process, information is to be gathered regarding the prospective purchase price of the Site relative to its fair market value. If there appears to be a value reduction, that reduction must be identified with respect to whether the difference may be attributed to environmental degradation of the property. Kleinfelder submitted a "User Questionnaire" to the Client that included a question about the prospective purchase price of the Site relative to its fair market value. Based on Kleinfelder's review of a questionnaire completed on December 8, 2016 by Mr. Michael Okuma with Costco, Mr. Okuma is not aware of environmental conditions

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associated with the Site that would reduce the purchase price of the property relative to its fair market value. A copy of the User Questionnaire is provided in Appendix C.

4.9 OTHER INFORMATION / DOCUMENTS PROVIDED

No other information was provided by the Client for review by Kleinfelder.

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5 SITE HISTORY

The history of the Site was researched to identify obvious uses. Historical land use was researched to the first developed use, or back to 1940, whichever was earlier or readily available. Table 5-1 summarizes the availability of information reviewed during this assessment.

TABLE 5-1
Historical Information Sources

SOURCE	YEARS REVIEWED	SOURCE / AVAILABILITY
SANBORN FIRE INSURANCE MAPS	Not available	EDR, 2016c
AERIAL PHOTOGRAPHS	1938, 1952, 1966, 1975, 1984, 1993, 1999, 2005, 2006, 2009, 2010, and 2012	EDR, 2016d
CITY DIRECTORIES	1974 – 2013 (select years)	EDR, 2016e
HISTORICAL TOPOGRAPHIC MAPS	1891, 1892, 1893, 1944, 1954, 1967, 1981, and 2012	EDR, 2016f
BUILDING DEPARTMENT	Not available	EDR, 2016g
PREVIOUS ASSESSMENT(S)	Not applicable	Not available

5.1 SANBORN FIRE INSURANCE MAPS

Sanborn Fire Insurance Maps provide historical land use information for some metropolitan areas and small, established towns. Kleinfelder requested EDR to search its library of Sanborn Fire Insurance Maps for maps of the Site. EDR responded that Sanborn Fire Insurance Maps were not available for the Site (EDR, 2016c).

5.2 AERIAL PHOTOGRAPHS

A review of historical aerial photography may indicate past activities at a property that may not be documented by other means or observed during a reconnaissance visit. The effectiveness of this technique depends on the scale and quality of the photographs and the available coverage. Aerial photographs were obtained from several historical photograph collections through EDR (2016d), and span a period of 74 years. A tabulation of the aerial photographs reviewed by Kleinfelder is presented in Table 5-2. Copies of the aerial photographs provided by EDR are included in Appendix D.

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TABLE 5-2
Historical Aerial Photographs Reviewed

YEAR	APPROXIMATE SCALE	SUMMARY
1938	1”=500’	**Site:** The Site appeared to be developed as agricultural land containing an orchard on the eastern half and another crop on the western half. A dirt road bisects the Site from north to south with a structure visible halfway through the Site. A curved drainage crossed the Site from east to west. A second structure associated with a residential building off-Site to the north is present adjoining the road on the northern boundary of the Site. **Surrounding Area:** Brace Road was visible along the north side of the Site and appeared to be dirt. A residential building and associated structures were located off-Site, north of the northern Site boundary. Railroad tracks and a paved parallel road were visible to the west of the Site. The surrounding area appeared to be primarily developed as orchards with rural residential structures and dirt roads.
1952	1”=500’	**Site:** The structures in the center and northern portions of the Site were removed, but the agricultural crops and dirt road remain. **Surrounding Area:** Brace Road appeared to be paved and the residential structure north of the Site was removed. The surrounding area was generally unchanged from the 1938 aerial photograph.
1966	1”=500’	**Site:** The orchards and associated dirt road were no longer present on the Site. A dirt road, a new structure, and a rectangular feature were visible on the eastern side of the Site. This dirt road extended southward from the northern boundary, along the west side of the structure and ended halfway into the Site at the rectangular feature. The rectangular feature was visible southeast of the end of the dirt road, extending in an east-west direction toward the eastern Site boundary. A small structure is present in the area between the road and the feature. It is not clear what this feature is and it is not shown on the topographic maps (Table 5-3). **Surrounding Area:** Seven large residential structures were visible adjacent to the northern boundary, on the south side of Brace Road. A structure was visible on the east side of the dirt road, adjacent to the eastern Site boundary. The southern extension of Sierra College Boulevard was visible and appeared to be paved. The surrounding area remained rural residential, but with fewer orchards visible. Interstate 80 was visible to the southeast of the Site.
1975	1”=500’	**Site:** The Site remained generally unchanged. Due to the poor quality of the photograph, features were not clear. **Surrounding Area:** Due to the poor quality of the photograph, features were not clear. However, the rural residential structures and orchards in the surrounding area no longer appeared to be visible. What appear to be two service stations are visible on the east and west sides of Sierra College Boulevard in the vicinity of the southbound Interstate 80 on/off ramps.
1984	1”=500’	**Site:** The Site appeared generally unchanged. **Surrounding Area:** The surrounding area appears unchanged relative to the 1975 photograph.

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TABLE 5-2 (Continued)
Historical Aerial Photographs Reviewed

YEAR	APPROXIMATE SCALE	SUMMARY
1993	1”=500’	**Site:** A narrow dirt road appeared to extend from the south end of the existing dirt road on the east side of the Site, winding across the Site to the west, and then exiting the Site to the north, to Brace Road. Possible structures are present in trees in the northeastern portion of the Site, near this dirt road. Due to the poor quality of the photograph, features were not clear. **Surrounding Area:** A new residential area was visible adjacent to the Site on the east, and a large commercial structure was visible across Sierra College Boulevard to the west. A dirt road was visible south of the Site in the area of the future Granite Drive. The surrounding area appeared to be increasingly developed with residential and commercial areas.
1999 2005 2006 2009 2010	1”=500’	**Site:** The Site appeared generally unchanged from the 1993 aerial photograph except that no structures appear to be on Site adjoining the dirt road. The east-west rectangular feature is no longer visible in the 1999 aerial photograph, although there now appear to be a stand of trees in the approximate location. The 2006 aerial photograph only shows the northern portion of the Site. The 2010 aerial photograph shows dirt paths winding through the Site and the structure on the eastern side of the Site no longer appears to be present. **Surrounding Area:** In the 1999 aerial photograph, the gasoline station on the east side of Sierra College Boulevard was no longer visible; however, another gasoline station was visible at the southeast corner of Sierra College Boulevard and Granite Drive, and another gasoline station was visible adjacent to the southern Site boundary. The gasoline station on the west side of Sierra College Boulevard near Interstate 80 is no longer visible in the 2009 aerial photograph.
2012	1”=500’	**Site:** The Site appeared generally unchanged. **Surrounding Area:** New commercial development was visible across Brace Road to the north of the Site. Additional construction was in progress to the south of the site, beyond the two gasoline stations.

Note: Aerial photographs only provide information concerning indications of land use, and no conclusions regarding the release of hazardous substances or petroleum products can be drawn from the review of photographs alone.

5.3 CITY DIRECTORIES

City directories provide information regarding property occupants by address. EDR provided a city directory image report (EDR, 2016e), included in Appendix D, for properties along Brace Road and Sierra College Boulevard for the period between 1974 and 2013. The Site has no physical address and was therefore not listed.

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Adjoining properties included residential listings at the addresses of 5340, 5350, 5360, 5370, 5380, and 5390 Brace Road, north of the Site, and commercial listings at the addresses 4020 and 4211 Sierra College Boulevard, west and south of the Site, respectively. The commercial listings at 4020 Sierra College Boulevard included multiple office and medical tenants. Commercial listings at address 4211 Sierra College Boulevard included a Chevron gasoline station and a McDonald's restaurant.

5.4 HISTORICAL TOPOGRAPHIC MAP REVIEW

Kleinfelder obtained information regarding historical topographic maps of the Site vicinity from EDR (2016f). The topographic maps reviewed for this assessment are listed in Table 5-3 and copies of the maps are included in Appendix D.

TABLE 5-3
Historical Topographic Maps Reviewed

YEAR	SCALE	SUMMARY
1891, 1892, 1893	1:125,000	**Site:** The Site was vacant with no structures. **Surrounding Area:** The surrounding properties were shown as vacant. Railroad tracks were shown to the west of the Site, with a road shown running parallel to the tracks.
1944	1:62,500	**Site:** The Site was shown as vacant, although a single structure was shown on the northern property line. **Surrounding Area:** The surrounding area showed rural development, with a network of paved and dirt roads and structures scattered along both. Paved roads were shown on the northern and western boundaries of the Site. The Town of Loomis was shown to the north as developed with paved roads and structures.
1954	1:24,000	**Site:** The Site was developed as orchard. The single structure remained on the northern property line. **Surrounding Area:** The surrounding area was developed with orchards and vineyards.
1967	1:24,000	**Site:** The Site was shown as vacant, and the orchard no longer present. The single structure on the northern boundary was no longer present. A second structure was now present on the eastern boundary of the Site adjacent to a dirt road running north-south from Brace Road in the northeast corner of the Site, and extending into the Site approximately 500 feet. **Surrounding Area:** Seven new, large structures were shown adjacent to the northern boundary. Additional structures were shown to the north and east of the Site. Interstate 80 is shown to the east of the Site.
1981	1:24,000	**Site:** The Site is depicted as essentially unchanged from the 1967 topographic map. **Surrounding Area**: The northern extension of Sierra College Boulevard, across the railroad tracks from the Site, was shown.

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TABLE 5-3 (Continued)
Historical Topographic Maps Reviewed

YEAR	SCALE	SUMMARY
2012	1:24,000	**Site:** The 2012 topographic map depicted roads and other physical features, but did not depict structures in the area. Thus, no structures or other features were depicted on the Site. **Surrounding Area:** Roads in the Site vicinity included Brace Road (adjoined to the north of the Site) and Sierra College Boulevard (adjoined to the west of the Site).

5.5 BUILDING DEPARTMENT

EDR provided an EDR Building Permit Report (EDR, 2016g) for the Site. EDR responded that it does not have access to the building parcel information for the Site. Additional information is presented in Sections 4.3.4 and 4.3.5.

5.6 PREVIOUS ASSESSMENTS

A previous Phase I Environmental Site Assessment, performed in 2005 by Soil Search Engineering, was provided to Kleinfelder for review. Soil Search Engineering reported that they found no RECs for the Site (Soil Search Engineering, 2005).

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6 SITE RECONNAISSANCE

Kleinfelder's Phase I ESA activities included a Site reconnaissance. This section summarizes the findings from the Site reconnaissance.

6.1 METHODOLOGY AND LIMITING CONDITIONS

Mr. Mark Lee of Kleinfelder performed a Site reconnaissance on September 19, 2016. The Site reconnaissance included a visual inspection of the Site to assist in identifying the presence or likely presence of hazardous substances or petroleum hydrocarbons under conditions that indicate an existing release, a past release, or threat of release into structures, soil, groundwater, or surface water at the Site (i.e., RECs). Observations of readily-apparent environmental conditions are summarized in Table 6-1, and color photographs of the Site are presented on Figures 3 through 8. The approximate Site boundaries are shown on Figure 2.

6.2 GENERAL SITE SETTING

The Site is located at the southeast corner of the intersection of Brace Road (located north of the Site) and Sierra College Boulevard (located west of the Site) in the Town of Loomis, California. At the time of the Site reconnaissance, the Site was vacant land.

6.3 SITE OBSERVATIONS

Kleinfelder's Site observations are summarized in Table 6-1.

TABLE 6-1
Site Observations

GENERAL OBSERVATIONS	REMARKS	OBSERVED	NOT OBSERVED
Current use	Vacant lot	X	
Current use likely to indicate RECs	None observed.		X
Past use	Not observed, although historical aerial photographs and topographic maps indicate the Site was once an orchard		X
Past use likely to indicate RECs	Not observed; however, persistent pesticides and petroleum hydrocarbons from smudge pots can be associated with orchards.		X
Structures	None observed.		X
Roads	Dirt paths, foot trails	X	
Topography of Site and surrounding area	Mostly flat with trees and brush	X	
ASTs	None observed on Site.		X

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GENERAL OBSERVATIONS	REMARKS	OBSERVED	NOT OBSERVED
Below grade vaults	One traffic signal vault at the northwest corner of the Site, along Brace Road.	X	
Burned or buried debris	None observed.		X
Chemical storage	None observed.		X
Chemical mixing areas	None observed.		X
Discolored soil or water	None observed.		X
Ditches, streams	Dry, running northwest-southeast through the center of the Site and west-east along the southern fence line.	X	
Drains and piping	None observed.		X
Drums	None observed.		X
Electrical or hydraulic equipment (polychlorinated biphenyls [PCBs])	One pole-mounted transformer adjacent to the east of the Site; potentially on Site. No Non-PCB sticker observed.	X	
INTERIOR AND EXTERIOR OBSERVATIONS OR ENVIRONMENTAL CONDITIONS THAT MAY INVOLVE THE USE, STORAGE, DISPOSAL OR GENERATION OF HAZARDOUS SUBSTANCES OR PETROLEUM PRODUCTS.		**OBSERVED**	**NOT OBSERVED**
Fill dirt from an unknown source	None observed.		X
Fill dirt from a known source	None observed.		X
Hazardous chemical and petroleum products in connection with known use	None observed.		X
Hazardous chemical and petroleum products in connection with unknown use	None observed.		X
Non-hazardous containers with contents	None observed.		X
Hazardous waste storage	None observed.		X
Heating and cooling system and fuel source	None observed.		X
Industrial waste treatment equipment	None observed.		X
Loading and unloading areas	None observed.		X
Odors	None observed.		X
Pits, ponds, or lagoons	None observed.		X
Pools of liquid	None observed.		X
Process waste water	None observed.		X
Sanitary sewer system	None observed.		X

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INTERIOR AND EXTERIOR OBSERVATIONS OR ENVIRONMENTAL CONDITIONS THAT MAY INVOLVE THE USE, STORAGE, DISPOSAL OR GENERATION OF HAZARDOUS SUBSTANCES OR PETROLEUM PRODUCTS.		OBSERVED	NOT OBSERVED
Septic system (e.g. tank and leach fields)	None observed.		X
Soil piles	A small soil pile was observed at the southeast corner of the Site (see Solid Waste below). Small soil piles were observed in the southeastern portion of the Site, created as dirt bike jumps.	X	
Solid waste/evidence of unauthorized dumping	Wood, wooden pallets, fencing material, miscellaneous debris, soil and brush were observed on the southeastern portion of the Site, adjacent to a gate built into the fence.	X	
Stained pavement, soil or concrete	None observed.		X
Stains or corrosion (interior, non-water)	None observed.		X
Storm drains/catch basins	Culverts and storm drains along Sierra College Boulevard, storm drains on Brace Road and Starlight Lane.	X	
Stressed vegetation	None observed.		X
Sumps and clarifiers	None observed.		X
Surface water	None observed.		X
Underground storage tank(s) (including heating oil tanks)	None observed.		X
Unidentified substance containers	None observed.		X
Waste water discharge	None observed.		X
Water supplies (potable and process)	None observed.		X
Wells (irrigation, monitoring, or domestic)	One domestic well along eastern Site boundary.	X	
Wells (dry)	None observed.		X
Wells (oil and gas)	None observed.		X

6.4 RESULTS OF SITE RECONNAISSANCE

The Site consists of vacant land with no structures or other features observed, other than Starlight Lane, which runs in a north-south direction at the northeastern corner of the Site. A dry stream crosses the Site from northwest to southeast. One domestic well adjacent to the eastern Site

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boundary may be on-Site. A gate was observed in the fencing that marked the boundary of the Site and the residences to the east, at the southeastern portion of the Site. Piles of wood, wooden pallets, fencing, dirt, brush and other debris were observed adjacent to the gate on Site (Figure 7). Hazardous materials were not observed in the debris pile, and it appeared to be used as a storage/disposal area by the adjoining resident. An area of disturbed ground was observed in the southeastern portion of the Site, which included small dirt piles as dirt bike jumps and associated small excavations.

Evidence of USTs, ASTs, pits, ponds, or lagoons was not observed on the Site during the reconnaissance. One AST was observed on the adjacent property to the north, which appeared to be a water tank (Figure 8).

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7 INTERVIEWS

Key Site Managers are contacted to obtain current and historical environmental information concerning the Site. The following sections highlight information revealed during the interviews.

7.1 INTERVIEW WITH CLIENT

Kleinfelder submitted a Phase I ESA User Questionnaire to the Client. The questionnaire was completed on December 8, 2016 by Mr. Michael Okuma with Costco. The questionnaire responses indicated the following:

- Costco, the User of this Phase I ESA, has no specialized knowledge or experience related to the Site or nearby properties.
- Costco does not have any information indicating that the purchase price being paid for the Site does not reasonably reflect the fair market value of the Site.
- Costco is not aware of conditions indicative of releases or threatened releases at the Site.
- Costco is not aware of obvious indicators that point to the presence or likely presence of contamination at the Site.

A copy of the User Questionnaire is provided in Appendix C.

7.2 INTERVIEW WITH OWNER/MANAGER

On September 14, 2016, Kleinfelder spoke with Peter Saetes, of Saetes Investments, who is the owner's representative for the Site. Mr. Saetes stated that there are 0.13 acre of wetlands present on the Site, and that the national permit is currently being prepared. He also noted that there were two residential structures formerly located adjacent to the Site east of Starlight Lane. These structures were demolished and removed as a fire project for the local fire department.

7.3 INTERVIEWS WITH LOCAL GOVERNMENT OFFICIALS

During a January 17, 2017 telephone conversation between Kleinfelder and Ms. Laura Rath, Environmental Health Specialist at Placer County Environmental Health, Ms. Rath indicated that lead arsenate was historically used in former orchards in Placer County, and that lead and arsenic are contaminants that are commonly found in soils.

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8 EVALUATION

Kleinfelder performed this Phase I ESA of the Site in conformance with the scope and limitations of the Standard Practice, the scope of services in our Proposal No. MPCOSTCO.001C/IRV16P45931, dated August 29, 2016, and in accordance with Costco Wholesale Development Requirements, Version 2014, Revised June 13, 2014. The following sections describe Kleinfelder's findings and provide general background information about the Site. Findings address RECs, HRECs, CRECs, and notation of *de minimis* quantities, as applicable to the Site. In summary, Kleinfelder's assessment revealed the following information concerning the Site:

8.1 BACKGROUND

The following is a summary of Site background information:

- The Site is located on Placer County APNs 045-042-034-000, 045-042-035-000, 045-042-036-000, and a portion of 045-042-037-000. The Site totals 17.2 acres.
- Most of the Site was historically developed as orchards from at least 1938 until sometime between 1954 and 1966. Dirt roads were present at the Site as early as 1938. A structure associated with a residential building located off-Site to the north was present on the northern Site boundary in 1938. A second structure (unknown purpose) was present in the center of the Site from at least 1938 until prior to 1952, and a third structure (unknown purpose) was present on the eastern side of the Site between 1966 and 2009. A well and a pole-mounted transformer were located on the eastern side of the Site adjoining the remains of the former eastern structure. Although the use of the structures is not known, the potential exists that they may have been associated with agricultural operations and storage of equipment and/or chemicals.

8.2 FINDINGS AND OPINIONS

The following is a summary of the findings and opinions of this Phase I ESA:

- Shallow soils across the Site and beneath the former Site structures may have been impacted with residual pesticides and petroleum hydrocarbons from historical orchard operations. Although the use of the structures is not known, the potential exists that they may have been associated with agricultural operations and storage of equipment and/or chemicals. Orchards typically utilize smudge pots which use petroleum hydrocarbons to reduce the potential for freezing, and also may have been routinely treated with pesticides (such as lead arsenate) and other chemicals, which may remain in the Site soils. Also,

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according to Placer County Environmental Health, lead and arsenic are contaminants commonly found at former orchards in Placer County.

- A rectangular feature was visible in aerial photographs near the south end of a dirt road (Starlight Lane), extending in an east-west direction toward the eastern Site boundary from at least 1966 through 1993. It is not clear what this feature was, but an area of disturbed ground was noted in the general vicinity during the Site reconnaissance. In Kleinfelder's opinion, the location of the former unknown feature warrants further investigation.
- A gate was observed in the fencing that marked the boundary of the Site and the residences to the east, at the southeastern portion of the Site. Piles of wood, wooden pallets, fencing, dirt, brush and other debris were observed adjacent to the gate on Site. This location appears to be used as a storage/disposal area by the adjoining resident. Hazardous materials were not observed in the debris pile.
- A gasoline station with USTs has operated since approximately 1999 on the adjacent property south of the Site. The gasoline station property is believed to be hydrogeologically cross-gradient to potentially up-gradient relative to the Site. Groundwater in the vicinity has been reported at depths as shallow as 2 feet bgs. Although no releases have been reported at the gasoline station, its operation for almost two decades increases the likelihood that undetected spills or leakage have occurred during operations, resulting in impacts to the shallow groundwater. Based on the gasoline station's potentially up-gradient location relative to the Site, impacted groundwater beneath the gasoline station may make its way towards and beneath the Site.

8.3 DEVIATIONS AND ADDITIONAL SERVICES

Kleinfelder's scope of services did not include Standard Practice non-scope evaluations of cultural, historic, and archaeological resources, ACM, radon, LBP, lead in drinking water, industrial hygiene, health and safety, indoor air quality/vapor intrusion, high-voltage power lines, or wetlands and surface water. Kleinfelder understands these non-scope evaluations may be requested by Kleinfelder at a later time. At the request of the Client, a wetlands survey was not included as part of the scope of services for this Phase I ESA.

Kleinfelder's scope of services included evaluations of threatened, endangered, and other protected species pursuant to Development Requirements, Version 2014, revised June 13, 2014. A summary of the results of these evaluations is provided in Section 8.3.1 below.

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8.3.1 Protected Plant/Wildlife Assessment

Kleinfelder contracted with Rincon Consultants to perform a biological survey for the potential occurrence of special status plant and wildlife species at the Site. A copy of Rincon's report is provided in Appendix E.

Rincon queried the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB). Based on Rincon's review of the database search results and the habitats observed at the Site during the Site reconnaissance, 31 special status plant species and 23 special status wildlife species have potential to occur at the Site.

Additionally, the Site contains nesting habitat for several bird species including raptors, and one nest consistent with a small raptor was observed on-Site. Nesting birds are protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC).

Rincon's report identified the following:

- All 31 of the special status plant species identified from within two miles of the Site have a moderate to high potential of occurrence on-Site, although the regular disking of the Site reduces the likelihood of occurrence.
- Twelve special status wildlife species are identified from within two miles of the Site. Of these, the purple martin and the white-tailed kite have a moderate to high potential for occurrence based on current Site conditions.
- Further analysis is needed to determine if the Site could support vernal pools and if, therefore, any vernal pool dependent species may potentially occur.
- Biological surveys are required for any plants listed in vernal pool areas for projects requiring 404 permits. Surveys should be conducted during the spring and summer months.
- The presence of numerous, large trees presents a high possibility for nesting birds to become present on the Site during the nesting season, generally February through August.
- To comply with MBTA and CFGC, all construction activities should be conducted outside of nesting season (February 1 through August 31). If nesting season is unavoidable, an initial bird survey must be conducted no more than 14 days prior to initiation of project activities (land clearing or vegetation removal). If nesting birds are found, construction activities must be conducted outside a buffer zone from the nest (minimum 100 feet for non-raptor species and 1,320 feet for raptor species).

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8.4 CONCLUSIONS

Kleinfelder has performed a Phase I ESA in conformance with the scope and limitations of ASTM E 1527-13 of the properties located at the southeast corner of Brace Road and Sierra College Boulevard in the Town of Loomis, Placer County, California. Any exceptions to, or deviations from, this practice are described in Section 8.3 of this report. This assessment has revealed the following RECs:

- The former orchard use of the Site, and associated structures that may been used for storage of equipment and/or chemicals. Orchards typically utilize smudge pots which use petroleum hydrocarbons to reduce the potential for freezing, and also may have been routinely treated with pesticides (such as lead arsenate) and other chemicals, which may remain in the Site soils. Also, according to Placer County Environmental Health, lead and arsenic are contaminants commonly found at former orchards in Placer County.
- The gasoline station adjoining the Site, which has operated for approximately 18 years. Although no releases have been reported at the gasoline station, its operation for almost two decades increases the likelihood that undetected spills or leakage have occurred during operations, resulting in impacts to the shallow groundwater. Based on the gasoline station's potentially up-gradient location relative to the Site, impacted groundwater beneath the gasoline station may make its way towards and beneath the Site.

Although not a REC, in Kleinfelder's opinion, the location of the former rectangular feature of unknown use at the east central portion of the Site warrants further investigation.

8.5 RECOMMENDATIONS

Based on the findings and conclusions of this Phase I ESA, Kleinfelder has the following recommendations for further assessment.

- To assess for impacts that may have resulted from historical orchard operations, Kleinfelder recommends sampling and analysis of the surficial soils across the Site and soils beneath the former Site structures for pesticides (specifically lead arsenate) and petroleum hydrocarbons.
- Based on the unknown use of the former rectangular feature observed in the aerial photographs, Kleinfelder recommends soil sampling at this location assess for contaminants in the subsurface.

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- Based on proximity and potential releases from the adjoining service station, conducting baseline soil and groundwater sampling is recommended at the location of the proposed Costco fueling facility.
- Debris and stored material along the eastern portion of the Site should be removed prior to construction.
- The groundwater well located on the eastern side of the Site should be abandoned per state and county standards.

8.6 DATA GAPS

Based on information obtained/reviewed as part of this Phase I ESA, it is Kleinfelder's opinion that no data gaps (which may constitute a data failure) have been identified.

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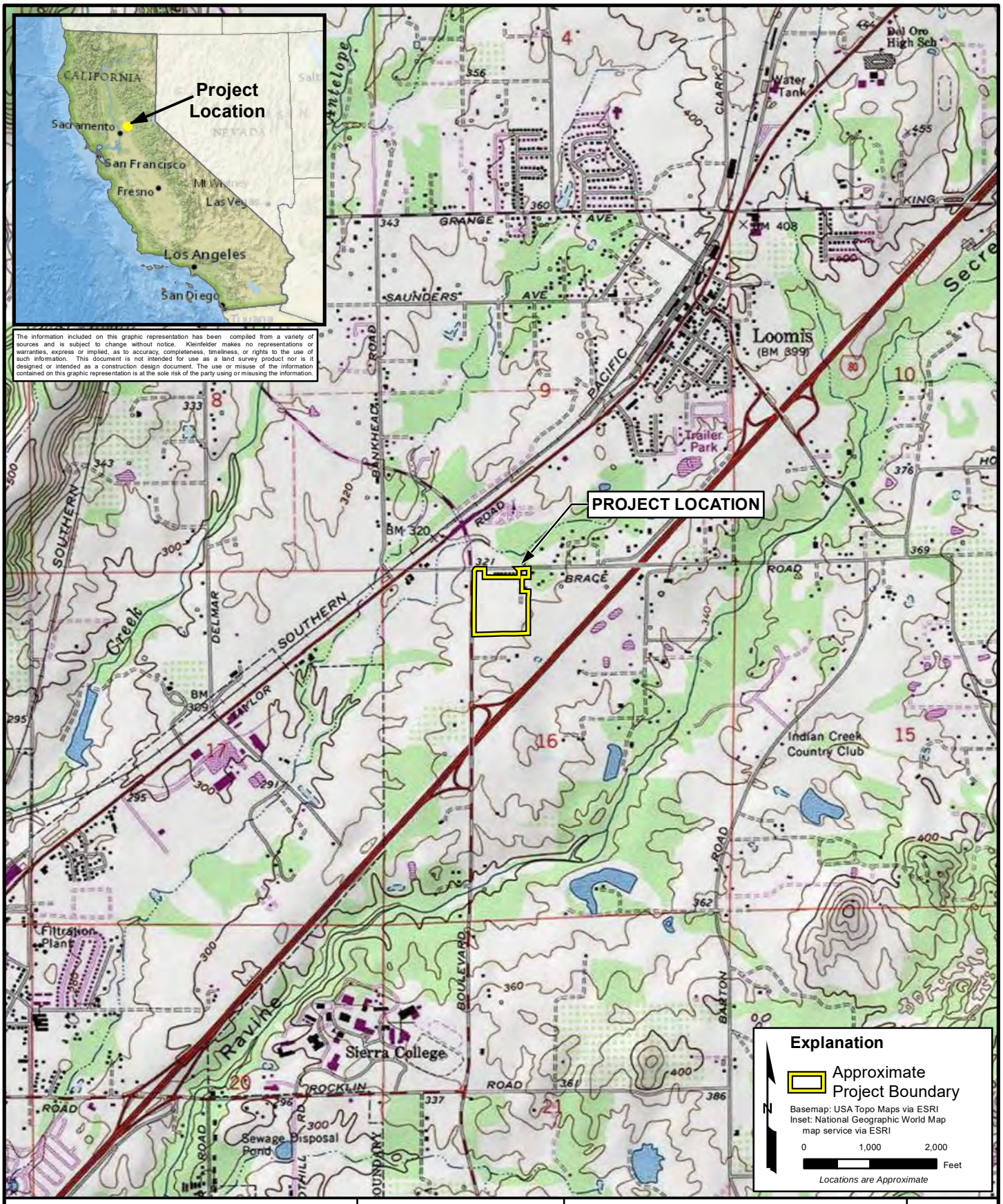
FIGURES



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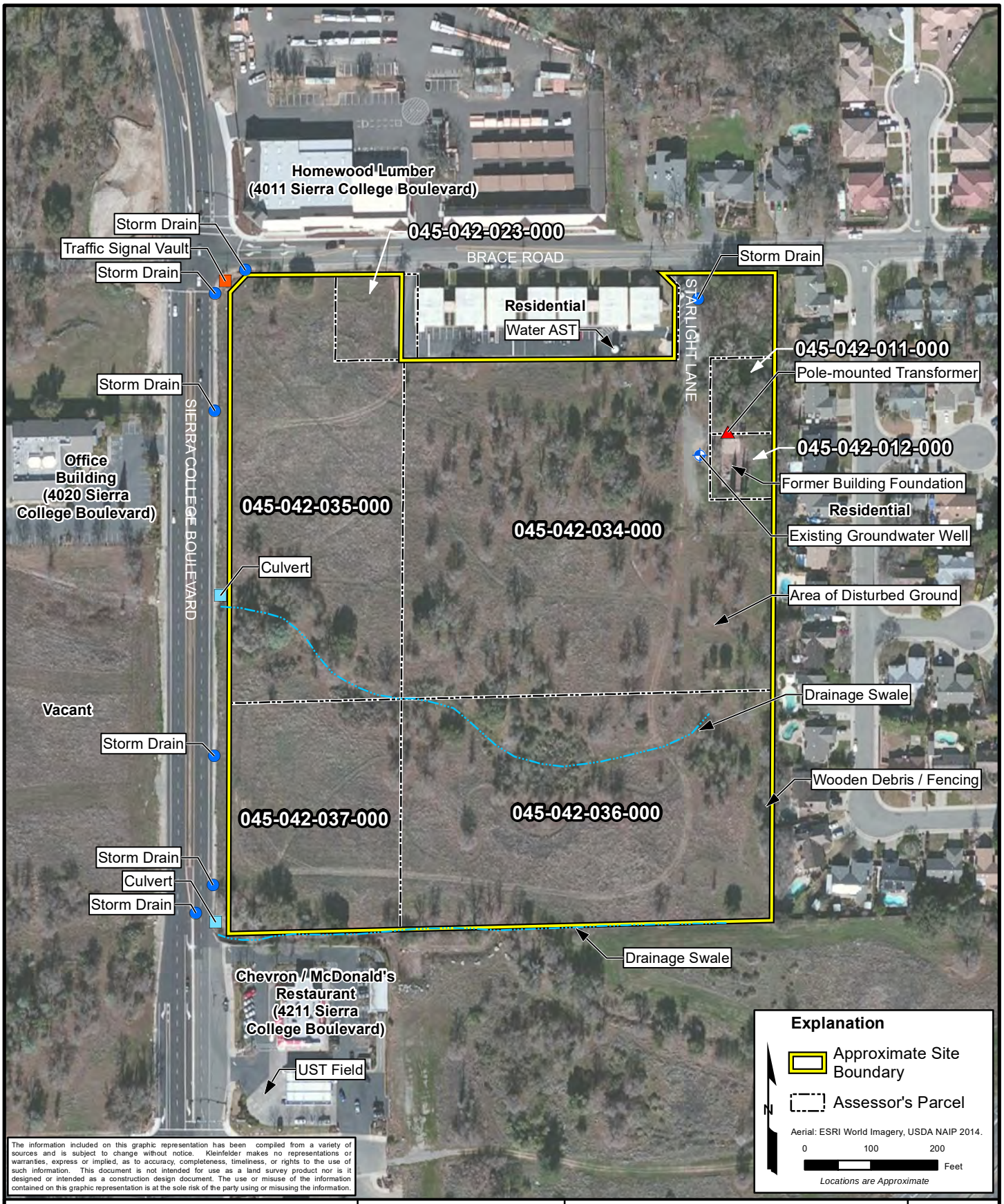
CHECKED BY:	M. CARROLL
FILE NAME:	Figure1.mxd

PROJECT LOCATION MAP

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD
LOOMIS, CALIFORNIA

FIGURE
1



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FILE NAME:	P1_Figure2.mxd

SITE VICINITY
AERIAL PHOTGRAPH

PROPOSED COSTCO WHOLESALE
WAREHOUSE AND FUEL FACILITY
SOUTHEAST CORNER OF BRACE ROAD AND
SIERRA COLLEGE BOULEVARD
LOOMIS, CALIFORNIA

FIGURE
2

View on-Site looking southwest from the intersection of Brace Road and Sierra College Boulevard.

View on-Site looking northeast from the southwestern corner of the Site.

Original in Color

KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT: 20172062 DRAWN: 10/2016 DRAWN BY: KFH CHECKED BY: MRC FILE NAME: Figure3-8.ppt	**SITE PHOTOGRAPHS** PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD LOOMIS, CALIFORNIA	FIGURE **3**

View on-Site looking northwest from the southeastern corner of the Site.

View on-Site looking north from the southern Site boundary.

Original in Color

KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT: 20172062 DRAWN: 10/2016 DRAWN BY: KFH CHECKED BY: MRC FILE NAME: Figure3-8.ppt	**SITE PHOTOGRAPHS** PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD LOOMIS, CALIFORNIA	FIGURE **4**

View off-Site looking north across Brace Road.

View off-Site looking north across Brace Road.

Original in Color

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SITE PHOTOGRAPHS

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD
LOOMIS, CALIFORNIA

FIGURE

5

View off-Site looking west across Sierra College Boulevard.

View of off-Site property adjacent to the south of the Site.

Original in Color

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Culvert near southwestern corner of the Site.

Wood debris / fencing on-Site, near the east side of the Site.

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SITE PHOTOGRAPHS

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD
LOOMIS, CALIFORNIA

FIGURE

7

Existing groundwater well adjacent to eastern Site boundary; potentially on-Site. Associated with pole-mounted transformer and foundation for removed residential structure. Transformer and foundation are off-Site.

Off-Site water AST located adjacent to northern Site boundary.

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SITE PHOTOGRAPHS

PROPOSED COSTCO WHOLESALE WAREHOUSE AND FUEL FACILITY
SOUTHEAST CORNER OF BRACE ROAD AND SIERRA COLLEGE BOULEVARD
LOOMIS, CALIFORNIA

FIGURE

8

APPENDIX A
STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

We declare that to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all-appropriate inquiries in conformance with the standards and practices set forth in CFR Part 312.

Karin F. Hagan
Environmental Professional

Lizanne Simmons, PG
Senior Principal Geologist

The resumes of above-listed environmental professionals performing this Phase I ESA are on file at the Kleinfelder office and are available upon request.

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APPENDIX B
REGULATORY AGENCY DATABASE REPORT

SEC Brace Rd and Sierra College Blvd
SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

Inquiry Number: 4722099.2s
September 08, 2016

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

SEC BRACE RD AND SIERRA COLLEGE BLVD
LOOMIS, CA 95650

COORDINATES

Latitude (North):	38.8092130 - 38˚ 48' 33.16''
Longitude (West):	121.2033690 - 121˚ 12' 12.12''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	655999.9
UTM Y (Meters):	4296930.5
Elevation:	336 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5629068 ROCKLIN, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140713
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
SEC BRACE RD AND SIERRA COLLEGE BLVD
LOOMIS, CA 95650

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	7-ELEVEN STORE #3263	4181 SIERRA COLLEGE	FINDS, ECHO	Lower	132, 0.025, SW
A2	CHEVRON STATION NO 2	4211 SIERRA	RCRA-SQG, FINDS, HAZNET, ECHO	Higher	149, 0.028, SSW
A3		4211 SIERRA COLLEGE	EDR Hist Auto	Lower	150, 0.028, SW
A4	CHEVRON USA - SIERRA	4211 SIERRA COLLEGE	EMI, CA PLACER CO. MS	Lower	150, 0.028, SW
A5	CHEVRON-ROCKLIN	4211 SIERRA COLLEGE	UST	Lower	150, 0.028, SW
A6	CHEVRON USA - SIERRA	4211 SIERRA COLLEGE	FINDS, ECHO	Lower	150, 0.028, SW
7	HOMEWOOD LUMBER	4011 SIERRA COLLEGE	CA PLACER CO. MS	Lower	282, 0.053, NNW
B8	7-ELEVEN INC.	4281 SIERRA COLLEGE	LUST, CA PLACER CO. MS	Higher	444, 0.084, SSW
B9	7-ELEVEN INC.	4281 SIERRA COLLEGE	LUST	Higher	444, 0.084, SSW
B10	7-11 CONVENIENCE STO	4281 SIERRA COLLEGE	UST	Higher	444, 0.084, SSW
B11	7-ELEVEN INC #32636	4281 SIERRA COLLEGE	FINDS, ECHO	Higher	456, 0.086, SSW
12	ARCO AMPM	4280 SIERRA COLLEGE	CA PLACER CO. MS, NPDES	Lower	588, 0.111, SSW
C13	SHAMROCK PUMP & EQUI	3985 TAYLOR RD (AKA:	LUST	Lower	703, 0.133, WNW
C14		3985 TAYLOR RD	EDR Hist Auto	Lower	746, 0.141, WNW
C15	AUTO-TEC	3985 TAYLOR RD	CA PLACER CO. MS	Lower	746, 0.141, WNW
D16	CHEVRON #6705 CLOSED	4365 SIERRA COLLEGE	SWEEPS UST, CA PLACER CO. MS	Higher	754, 0.143, SSW
D17	CHEVRON #9-6705	4365 SIERRA COLLEGE	LUST, SWEEPS UST, HIST CORTESE	Higher	754, 0.143, SSW
D18	96705	4365 SIERRA COLLEGE	HIST UST	Higher	754, 0.143, SSW
19	KOA, LOOMIS	3945 TAYLOR RD	CA PLACER CO. MS	Higher	841, 0.159, NNE
D20	HIGHBRIDGE RANCH	4436 SIERRA COLLEGE	SWEEPS UST, HIST UST	Higher	844, 0.160, SSW
C21	VALLEY ROCK (LOOMIS)	4018 TAYLOR RD	SLIC, CA PLACER CO. MS	Lower	857, 0.162, WNW
D22	TARGET STORE T2604	5104 COMMONS DR	RCRA-SQG, FINDS, ECHO	Higher	899, 0.170, SSW
E23	FOREST PRODUCTS MANU	PACIFIC STREET, INDU	SLIC	Lower	921, 0.174, West
E24	MC CONCEPTS LLC	4013 TAYLOR RD	HAZNET, CA PLACER CO. MS	Lower	951, 0.180, WNW
25		4390 SIERRA COLLEGE	EDR Hist Auto	Higher	1028, 0.195, SSW
26	DEL MAR HEADQUARTERS	3930 SIERRA COLLEGE	RCRA-SQG, FINDS, CA PLACER CO. MS, ECHO	Lower	1105, 0.209, NW
27	PEARSON AUTOMOTIVE S	4175 TAYLOR RD	HIST CORTESE, CA PLACER CO. MS	Lower	1377, 0.261, West
28	SAMUEL E. ROSE & BET	3921 SIERRA COLLEGE	SWEEPS UST, HIST UST	Lower	1458, 0.276, NNW
F29	SS #6008 (FORMER UNO	4390 SIERRA COLLEGE	LUST, SWEEPS UST, HIST CORTESE, CA PLACER CO. MS	Lower	1590, 0.301, SW
F30	SS #6008 (FORMER UNO	4390 SIERRA COLLEGE	LUST	Lower	1590, 0.301, SW
F31	UNION OIL SS 6008	4390 SIERRA COLLEGE	HIST UST	Lower	1590, 0.301, SW
32	FOREST PRODUCTS MANU	ANTHONY COURT	RESPONSE, ENVIROSTOR, HIST Cal-Sites	Lower	3338, 0.632, WSW
33	ROCKLIN OPERATION	300 DOMINGUEZ RD	ENF, WDS	Lower	3628, 0.687, SW
34	FOREST PRODUCTS MFG.	4315 DOMINGUEZ ROAD	CA BOND EXP. PLAN, EMI	Lower	3735, 0.707, WSW
35	LOOMIS MS4 PHASE II	6140 HORSESHOE BAR	ENF, NPDES, WDS	Higher	4142, 0.784, NE
36	LOUISIANA-PACIFIC CO	4300 DOMINGUEZ ROAD	ENVIROSTOR, LUST, HIST CORTESE, CA PLACER CO. MS,...	Lower	4397, 0.833, WSW
37	LEGACY PLUMBING	4335 PACIFIC ST	ENVIROSTOR, EMI	Lower	4746, 0.899, WSW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ..... Federal Facility Site Information listing
SEMS ..... Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-CESQG ..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ..... Land Use Control Information System
US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROL ..... Sites with Institutional Controls

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Federal ERNS list

ERNS..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
AST..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

VCP..... Voluntary Cleanup Program Properties
INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT..... Waste Management Unit Database
SWRCY..... Recycler Database
HAULERS..... Registered Waste Tire Haulers Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
ODI..... Open Dump Inventory

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register
SCH..... School Property Evaluation Program
CDL..... Clandestine Drug Labs
Toxic Pits..... Toxic Pits Cleanup Act Sites
US CDL..... National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

CA FID UST..... Facility Inventory Database

EXECUTIVE SUMMARY

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information
DEED	Deed Restriction Listing

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
UXO	Unexploded Ordnance Sites
DOCKET HWC	Hazardous Waste Compliance Docket Listing
Cortese	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings	CUPA Resources List
DRYCLEANERS	Cleaner Facilities
EMI	Emissions Inventory Data

EXECUTIVE SUMMARY

Financial Assurance..... Financial Assurance Information Listing
HAZNET..... Facility and Manifest Data
HWP..... EnviroStor Permitted Facilities Listing
HWT..... Registered Hazardous Waste Transporter Database
MINES..... Mines Site Location Listing
MWMP..... Medical Waste Management Program Listing
NPDES..... NPDES Permits Listing
PEST LIC..... Pesticide Regulation Licenses Listing
PROC..... Certified Processors Database
Notify 65..... Proposition 65 Records
UIC..... UIC Listing
WASTEWATER PITS..... Oil Wastewater Pits Listing
WDS..... Waste Discharge System
WIP..... Well Investigation Program Case List
ICE..... ICE
FUELS PROGRAM..... EPA Fuels Program Registered Listing
ECHO..... Enforcement & Compliance History Information

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP..... EDR Proprietary Manufactured Gas Plants
EDR Hist Cleaner..... EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF..... Recovered Government Archive Solid Waste Facilities List
RGA LUST..... Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting

the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 06/21/2016 has revealed that there are 3 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON STATION NO 2	***4211 SIERRA***	***SSW 0 - 1/8 (0.028 mi.)***	***A2***	***8***
TARGET STORE T2604	***5104 COMMONS DR***	***SSW 1/8 - 1/4 (0.170 mi.)***	***D22***	***38***

Lower Elevation	Address	Direction / Distance	Map ID	Page
DEL MAR HEADQUARTERS	***3930 SIERRA COLLEGE***	***NW 1/8 - 1/4 (0.209 mi.)***	***26***	***44***

State- and tribal - equivalent NPL

RESPONSE: Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

A review of the RESPONSE list, as provided by EDR, has revealed that there is 1 RESPONSE site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FOREST PRODUCTS MANU	***ANTHONY COURT***	***WSW 1/2 - 1 (0.632 mi.)***	***32***	***53***

Database: RESPONSE, Date of Government Version: 05/02/2016
Status: Certified
Facility Id: 31240008

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 05/02/2016 has revealed that there are 3 ENVIROSTOR sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FOREST PRODUCTS MANU	***ANTHONY COURT***	***WSW 1/2 - 1 (0.632 mi.)***	***32***	***53***
Facility Id: 31240008 Status: Certified				
LOUISIANA-PACIFIC CO	***4300 DOMINGUEZ ROAD***	***WSW 1/2 - 1 (0.833 mi.)***	***36***	***77***

Facility Id: 31240011
Status: Refer: Other Agency

LEGACY PLUMBING ***4335 PACIFIC ST*** ***WSW 1/2 - 1 (0.899 mi.)*** ***37*** ***84***
Facility Id: 31240007
Status: Refer: Other Agency

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, has revealed that there are 6 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
7-ELEVEN INC.	***4281 SIERRA COLLEGE***	***SSW 0 - 1/8 (0.084 mi.)***	***B8***	***16***
Database: LUST REG 5, Date of Government Version: 07/01/2008 Status: Case Closed				
7-ELEVEN INC.	4281 SIERRA COLLEGE	SSW 0 - 1/8 (0.084 mi.)	B9	17
Database: LUST, Date of Government Version: 06/13/2016 Status: Completed - Case Closed Global Id: T0606190594				
CHEVRON #9-6705	***4365 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.143 mi.)***	***D17***	***30***
Database: LUST, Date of Government Version: 06/13/2016 Database: LUST REG 5, Date of Government Version: 07/01/2008 Status: Completed - Case Closed Status: Case Closed Global Id: T0606100025				

Lower Elevation	Address	Direction / Distance	Map ID	Page
SHAMROCK PUMP & EQUI	3985 TAYLOR RD (AKA:	WNW 1/8 - 1/4 (0.133 mi.)	C13	26
Database: LUST, Date of Government Version: 06/13/2016 Database: LUST REG 5, Date of Government Version: 07/01/2008 Status: Completed - Case Closed Status: Case Closed Global Id: T0606100075				
SS #6008 (FORMER UNO	***4390 SIERRA COLLEGE***	***SW 1/4 - 1/2 (0.301 mi.)***	***F29***	***47***
Database: LUST, Date of Government Version: 06/13/2016 Status: Completed - Case Closed Global Id: T0606100283				
SS #6008 (FORMER UNO	4390 SIERRA COLLEGE	SW 1/4 - 1/2 (0.301 mi.)	F30	53
Database: LUST REG 5, Date of Government Version: 07/01/2008 Status: Case Closed				

SLIC: SLIC Region comes from the California Regional Water Quality Control Board.

A review of the SLIC list, as provided by EDR, has revealed that there are 2 SLIC sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
VALLEY ROCK (LOOMIS)	***4018 TAYLOR RD***	***WNW 1/8 - 1/4 (0.162 mi.)***	***C21***	***37***
Database: SLIC, Date of Government Version: 06/13/2016 Facility Status: Open - Inactive Global Id: SLT5SB163554				
FOREST PRODUCTS MANU	PACIFIC STREET, INDU	W 1/8 - 1/4 (0.174 mi.)	E23	41
Database: SLIC, Date of Government Version: 06/13/2016 Facility Status: Completed - Case Closed Global Id: SLT5S1393179				

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, has revealed that there are 2 UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
7-11 CONVENIENCE STO	4281 SIERRA COLLEGE	SSW 0 - 1/8 (0.084 mi.)	B10	23
Database: UST, Date of Government Version: 06/13/2016 Facility Id: FA0004054				

Lower Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON-ROCKLIN	4211 SIERRA COLLEGE	SW 0 - 1/8 (0.028 mi.)	A5	15
Database: UST, Date of Government Version: 06/13/2016 Facility Id: FA0003651				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

HIST Cal-Sites: Formerly known as ASPIS, this database contains both known and potential hazardous substance sites. The source is the California Department of Toxic Substance Control. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

A review of the HIST Cal-Sites list, as provided by EDR, and dated 08/08/2005 has revealed that there is 1 HIST Cal-Sites site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FOREST PRODUCTS MANU	***ANTHONY COURT***	***WSW 1/2 - 1 (0.632 mi.)***	***32***	***53***

EXECUTIVE SUMMARY

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 5 SWEEPS UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON #6705 CLOSED Status: A Tank Status: A Comp Number: 491	***4365 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.143 mi.)***	***D16***	***29***
CHEVRON #9-6705 Status: A Tank Status: A Comp Number: 62907	***4365 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.143 mi.)***	***D17***	***30***
HIGHBRIDGE RANCH Status: A Tank Status: A Comp Number: 44925	***4436 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.160 mi.)***	***D20***	***36***

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAMUEL E. ROSE & BET Status: A Tank Status: A Comp Number: 46427	***3921 SIERRA COLLEGE***	***NNW 1/4 - 1/2 (0.276 mi.)***	***28***	***46***
SS #6008 (FORMER UNO Status: A Tank Status: A Comp Number: 953	***4390 SIERRA COLLEGE***	***SW 1/4 - 1/2 (0.301 mi.)***	***F29***	***47***

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 4 HIST UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
96705 Facility Id: 00000062907	4365 SIERRA COLLEGE	SSW 1/8 - 1/4 (0.143 mi.)	D18	35
HIGHBRIDGE RANCH Facility Id: 00000044925	***4436 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.160 mi.)***	***D20***	***36***

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAMUEL E. ROSE & BET Facility Id: 00000046427	***3921 SIERRA COLLEGE***	***NNW 1/4 - 1/2 (0.276 mi.)***	***28***	***46***
UNION OIL SS 6008	4390 SIERRA COLLEGE	SW 1/4 - 1/2 (0.301 mi.)	F31	53

EXECUTIVE SUMMARY

Facility Id: 00000060740

Other Ascertainable Records

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 07/20/2015 has revealed that there are 6 FINDS sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON STATION NO 2	***4211 SIERRA***	***SSW 0 - 1/8 (0.028 mi.)***	***A2***	***8***
7-ELEVEN INC #32636	***4281 SIERRA COLLEGE***	***SSW 0 - 1/8 (0.086 mi.)***	***B11***	***23***
TARGET STORE T2604	***5104 COMMONS DR***	***SSW 1/8 - 1/4 (0.170 mi.)***	***D22***	***38***

Lower Elevation	Address	Direction / Distance	Map ID	Page
7-ELEVEN STORE #3263	***4181 SIERRA COLLEGE***	***SW 0 - 1/8 (0.025 mi.)***	***A1***	***8***
CHEVRON USA - SIERRA	***4211 SIERRA COLLEGE***	***SW 0 - 1/8 (0.028 mi.)***	***A6***	***16***
DEL MAR HEADQUARTERS	***3930 SIERRA COLLEGE***	***NW 1/8 - 1/4 (0.209 mi.)***	***26***	***44***

CA BOND EXP. PLAN: Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

A review of the CA BOND EXP. PLAN list, as provided by EDR, and dated 01/01/1989 has revealed that there is 1 CA BOND EXP. PLAN site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
FOREST PRODUCTS MFG.	***4315 DOMINGUEZ ROAD***	***WSW 1/2 - 1 (0.707 mi.)***	***34***	***65***

ENF: A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

A review of the ENF list, as provided by EDR, and dated 05/25/2016 has revealed that there are 2 ENF sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LOOMIS MS4 PHASE II Status: Active Status: Historical Facility Id: 237358	***6140 HORSESHOE BAR***	***NE 1/2 - 1 (0.784 mi.)***	***35***	***72***

Lower Elevation	Address	Direction / Distance	Map ID	Page
ROCKLIN OPERATION	***300 DOMINGUEZ RD***	***SW 1/2 - 1 (0.687 mi.)***	***33***	***63***

Status: Historical
Status: Active
Facility Id: 253150

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 3 HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON #9-6705 Reg Id: 310031	***4365 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.143 mi.)***	***D17***	***30***

Lower Elevation	Address	Direction / Distance	Map ID	Page
PEARSON AUTOMOTIVE S Reg Id: 310091	***4175 TAYLOR RD***	***W 1/4 - 1/2 (0.261 mi.)***	***27***	***46***
SS #6008 (FORMER UNO Reg Id: 310341	***4390 SIERRA COLLEGE***	***SW 1/4 - 1/2 (0.301 mi.)***	***F29***	***47***

CA PLACER CO. MS: Placer County Master List of Facilities includes Aboveground Hazardous Material tanks, Underground Storage tanks, Site Clean-up sites.

A review of the CA PLACER CO. MS list, as provided by EDR, and dated 06/16/2016 has revealed that there are 10 CA PLACER CO. MS sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
7-ELEVEN INC. Facility Status: Active Facility Id: FA0004054	***4281 SIERRA COLLEGE***	***SSW 0 - 1/8 (0.084 mi.)***	***B8***	***16***
CHEVRON #6705 CLOSED Facility Status: Closed Facility Id: FA0000491	***4365 SIERRA COLLEGE***	***SSW 1/8 - 1/4 (0.143 mi.)***	***D16***	***29***
KOA, LOOMIS Facility Status: Closed Facility Status: Active Facility Id: FA0001712 Facility Id: FA0008513	3945 TAYLOR RD	NNE 1/8 - 1/4 (0.159 mi.)	19	36

Lower Elevation	Address	Direction / Distance	Map ID	Page
CHEVRON USA - SIERRA Facility Status: Active Facility Id: FA0003651	***4211 SIERRA COLLEGE***	***SW 0 - 1/8 (0.028 mi.)***	***A4***	***12***
HOMEWOOD LUMBER Facility Status: Active Facility Id: FA0018363	4011 SIERRA COLLEGE	NNW 0 - 1/8 (0.053 mi.)	7	16
ARCO AMPM	***4280 SIERRA COLLEGE***	***SSW 0 - 1/8 (0.111 mi.)***	***12***	***24***

Facility Status: Active Facility Id: FA0019746				
AUTO-TEC Facility Status: Active Facility Id: FA0003942	3985 TAYLOR RD	WNW 1/8 - 1/4 (0.141 mi.)	C15	28
VALLEY ROCK (LOOMIS) Facility Status: Active Facility Id: FA0004231	***4018 TAYLOR RD***	***WNW 1/8 - 1/4 (0.162 mi.)***	***C21***	***37***
MC CONCEPTS LLC Facility Status: Active Facility Id: FA0019936	***4013 TAYLOR RD***	***WNW 1/8 - 1/4 (0.180 mi.)***	***E24***	***42***
DEL MAR HEADQUARTERS Facility Status: Active Facility Id: FA0001929	***3930 SIERRA COLLEGE***	***NW 1/8 - 1/4 (0.209 mi.)***	***26***	***44***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 3 EDR Hist Auto sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	4390 SIERRA COLLEGE	SSW 1/8 - 1/4 (0.195 mi.)	25	43

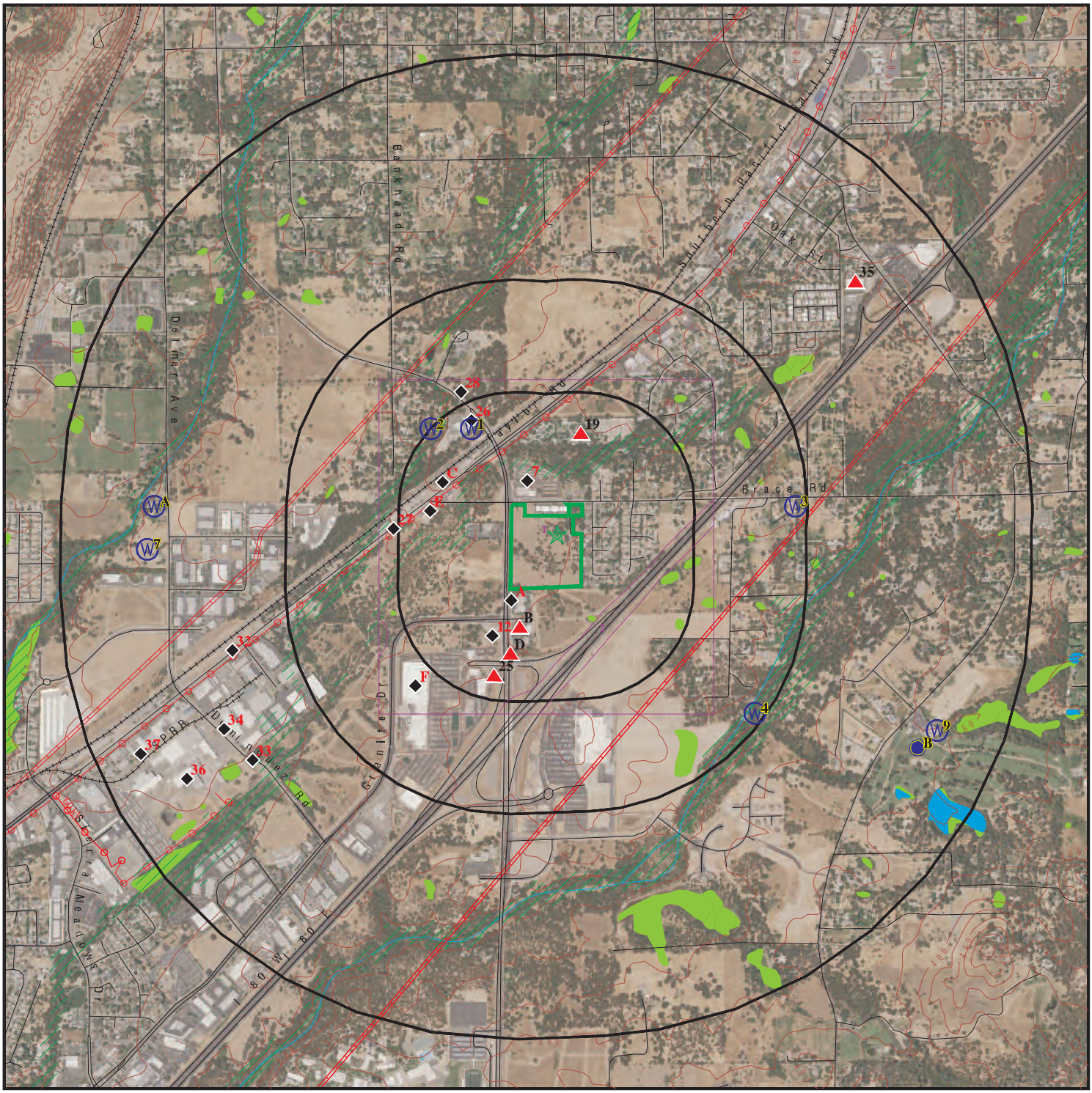
Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	4211 SIERRA COLLEGE	SW 0 - 1/8 (0.028 mi.)	A3	11
Not reported	3985 TAYLOR RD	WNW 1/8 - 1/4 (0.141 mi.)	C14	28

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 5 records.

Site Name	Database(s)
SIERRA COLLEGE BLVD WIDENING GRANI	NPDES
INTERSTATE 80 AT SIERRA COLLEGE BL	NPDES
SIERRA COLLEGE BLVD WIDENING FROM	NPDES
LINCOLN HIGHWAY ABANDONMENT PARCEL	SLIC
FOREST PRODUCTS MANUFACTURING ?	SLIC

OVERVIEW MAP - 4722099.2S



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: SEC Brace Rd and Sierra College Blvd	CLIENT: Kleinfelder, Inc.
ADDRESS: SEC Brace Rd and Sierra College Blvd Loomis CA 95650	CONTACT: Karin Hagan INQUIRY #: 4722099.2s
LAT/LONG: 38.809213 / 121.203369	DATE: September 08, 2016 4:59 pm

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DETAIL MAP - 4722099.2S

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

Power transmission lines

Pipelines

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	SEC Brace Rd and Sierra College Blvd	CLIENT:	Kleinfelder, Inc.
ADDRESS:	SEC Brace Rd and Sierra College Blvd Loomis CA 95650	CONTACT:	Karin Hagan
		INQUIRY #:	4722099.2s
LAT/LONG:	38.809213 / 121.203369	DATE:	September 08, 2016 5:02 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	0.500		0	0	0	NR	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	1.000		0	0	0	0	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		1	2	NR	NR	NR	3
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	TP		NR	NR	NR	NR	NR	0
US INST CONTROL	TP		NR	NR	NR	NR	NR	0
Federal ERNS list								
ERNS	0.250		0	0	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	1	NR	1
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	3	NR	3
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	1.000		0	0	0	0	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		2	2	2	NR	NR	6

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	2	0	NR	NR	2
State and tribal registered storage tank lists								
FEMA UST	0.500		0	0	0	NR	NR	0
UST	0.500		2	0	0	NR	NR	2
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	1	NR	1
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.500		0	3	2	NR	NR	5
HIST UST	0.500		0	2	2	NR	NR	4
CA FID UST	0.500		0	0	0	NR	NR	0
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	0.250		0	0	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	1.000		0	0	0	0	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.250		4	2	NR	NR	NR	6
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	1	NR	1
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	1.000		0	0	0	2	NR	2
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	1	2	NR	NR	3
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MINES	TP		NR	NR	NR	NR	NR	0
CA PLACER CO. MS	0.250		4	6	NR	NR	NR	10
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
ICE	1.000		0	0	0	0	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.250		1	2	NR	NR	NR	3
EDR Hist Cleaner	0.250		0	0	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	14	22	8	8	0	52

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 SW < 1/8 0.025 mi. 132 ft. | **7-ELEVEN STORE #32636 - SIERRA** | **FINDS ECHO** | **1015971279 N/A**
4181 SIERRA COLLEGE BLVD
ROCKLIN, CA 95677

Site 1 of 6 in cluster A

Relative: Lower

Actual: 334 ft.

FINDS:

Registry ID: 110054315059

Environmental Interest/Information System
AIR EMISSIONS CLASSIFICATION UNKNOWN

ECHO:

Envid: 1015971279
Registry ID: 110054315059
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110054315059

A2 SSW < 1/8 0.028 mi. 149 ft. | **CHEVRON STATION NO 205777** | **RCRA-SQG FINDS HAZNET ECHO** | **1006805094 CAR000123398**
4211 SIERRA
ROCKLIN, CA 95677

Site 2 of 6 in cluster A

Relative: Higher

Actual: 337 ft.

RCRA-SQG:

Date form received by agency: 05/16/2002
Facility name: CHEVRON STATION NO 205777
Facility address: 4211 SIERRA
ROCKLIN, CA 956773907
EPA ID: CAR000123398
Mailing address: P O BOX 6004
SAN RAMON, CA 94583
Contact: KATHY NORRIS
Contact address: P O BOX 6004
SAN RAMON, CA 94583
Contact country: US
Contact telephone: (925) 842-5931
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name: CHEVRON PRODUCTS CO
Owner/operator address: P O BOX 6004
SAN RAMON, CA 94583
Owner/operator country: Not reported
Owner/operator telephone: (925) 842-5931
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

CHEVRON STATION NO 205777 (Continued) **1006805094**

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D018
. Waste name: BENZENE

Violation Status: No violations found

FINDS:

Registry ID: 110013310176

Environmental Interest/Information System

California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

STATE MASTER

HAZNET:

envid:	1006805094
Year:	2014
GEPAID:	CAR000123398
Contact:	KATHY NORRIS-SLUSHER
Telephone:	8773866044
Mailing Name:	Not reported
Mailing Address:	PO BOX 6004
Mailing City,St,Zip:	SAN RAMON, CA 945830000
Gen County:	Placer
TSD EPA ID:	CAD059494310
TSD County:	Santa Clara

CHEVRON STATION NO 205777 (Continued) **1006805094**

Waste Category:	Other organic solids
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.0725
Cat Decode:	Other organic solids
Method Decode:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County:	Placer

envid:	1006805094
Year:	2014
GEPAID:	CAR000123398
Contact:	KATHY NORRIS-SLUSHER
Telephone:	8773866044
Mailing Name:	Not reported
Mailing Address:	PO BOX 6004
Mailing City,St,Zip:	SAN RAMON, CA 945830000
Gen County:	Placer
TSD EPA ID:	CAD059494310
TSD County:	Santa Clara
Waste Category:	Aqueous solution with total organic residues less than 10 percent
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.564
Cat Decode:	Aqueous solution with total organic residues less than 10 percent
Method Decode:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County:	Placer

envid:	1006805094
Year:	2014
GEPAID:	CAR000123398
Contact:	KATHY NORRIS-SLUSHER
Telephone:	8773866044
Mailing Name:	Not reported
Mailing Address:	PO BOX 6004
Mailing City,St,Zip:	SAN RAMON, CA 945830000
Gen County:	Placer
TSD EPA ID:	CAD059494310
TSD County:	Santa Clara
Waste Category:	Not reported
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	Not reported
Cat Decode:	Not reported
Method Decode:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County:	Placer

envid:	1006805094
Year:	2014
GEPAID:	CAR000123398
Contact:	KATHY NORRIS-SLUSHER
Telephone:	8773866044
Mailing Name:	Not reported
Mailing Address:	PO BOX 6004
Mailing City,St,Zip:	SAN RAMON, CA 945830000

CHEVRON STATION NO 205777 (Continued) **1006805094**

Gen County:	Placer
TSD EPA ID:	UTD981552177
TSD County:	99
Waste Category:	Other organic solids
Disposal Method:	Incineration--Thermal Destruction Other Than Use As A Fuel
Tons:	0.035
Cat Decode:	Other organic solids
Method Decode:	Incineration--Thermal Destruction Other Than Use As A Fuel
Facility County:	Placer

envid:	1006805094
Year:	2013
GEPAID:	CAR000123398
Contact:	KATHY NORRIS-SLUSHER
Telephone:	8773866044
Mailing Name:	Not reported
Mailing Address:	PO BOX 6004
Mailing City,St,Zip:	SAN RAMON, CA 945830000
Gen County:	Placer
TSD EPA ID:	CAD059494310
TSD County:	Santa Clara
Waste Category:	Not reported
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.078
Cat Decode:	Not reported
Method Decode:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County:	Not reported

Click this hyperlink while viewing on your computer to access
34 additional CA_HAZNET: record(s) in the EDR Site Report.

ECHO:

Envid:	1006805094
Registry ID:	110013310176
DFR URL:	http://echo.epa.gov/detailed_facility_report?fid=110013310176

A3 **EDR Hist Auto** **1015487167**
SW **4211 SIERRA COLLEGE BLVD** **N/A**
< 1/8 **ROCKLIN, CA 95677**
0.028 mi.
150 ft. **Site 3 of 6 in cluster A**

Relative:
Lower

Actual:
335 ft.

EDR Historical Auto Stations:

Name:	CHEVRON STATION 1581
Year:	2000
Address:	4211 SIERRA COLLEGE BLVD

Name:	CHEVRON STATION 1581
Year:	2001
Address:	4211 SIERRA COLLEGE BLVD

Name:	CHEVRON STATION 1581
Year:	2002
Address:	4211 SIERRA COLLEGE BLVD

(Continued) **1015487167**

Name: CHEVRON STATION 1581
Year: 2003
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATION 1581
Year: 2004
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATION 1581
Year: 2005
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATION INC
Year: 2006
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATIONS INC
Year: 2007
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATIONS INC 1581
Year: 2008
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATIONS INC 1581
Year: 2009
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON
Year: 2010
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON
Year: 2011
Address: 4211 SIERRA COLLEGE BLVD

Name: CHEVRON STATION 1581
Year: 2012
Address: 4211 SIERRA COLLEGE BLVD

A4 **CHEVRON USA - SIERRA COLLEGE B** **EMI** **S103955772**
SW **4211 SIERRA COLLEGE BLVD** **CA PLACER CO. MS** **N/A**
< 1/8 **ROCKLIN, CA 95677**
0.028 mi.
150 ft. **Site 4 of 6 in cluster A**

Relative:
Lower

Actual:
335 ft.

EMI:

Year:	2008
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.8369235
Reactive Organic Gases Tons/Yr:	1.83012688305

CHEVRON USA - SIERRA COLLEGE B (Continued) **S103955772**

Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2009
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.9837400000000001
Reactive Organic Gases Tons/Yr:	1.984
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2010
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.9069050000000001
Reactive Organic Gases Tons/Yr:	1.8998494515
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2011
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.906905
Reactive Organic Gases Tons/Yr:	1.8998494515
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

CHEVRON USA - SIERRA COLLEGE B (Continued) **S103955772**

Year:	2012
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.906905
Reactive Organic Gases Tons/Yr:	1.8998494515
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2013
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.906905
Reactive Organic Gases Tons/Yr:	1.906905
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2014
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.842
Reactive Organic Gases Tons/Yr:	1.842
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2015
County Code:	31
Air Basin:	SV
Facility ID:	944
Air District Name:	PLA
SIC Code:	5541

CHEVRON USA - SIERRA COLLEGE B (Continued) **S103955772**

Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.842
Reactive Organic Gases Tons/Yr:	1.842
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

PLACER CO. MS:

Facility ID:	FA0003651
Facility Status:	Active
Program Element Code:	2303
Program:	UNDERGROUND STORAGE TANKS - 3 TANKS
Record Num:	PR0005480
District Code:	18
Decode for Fstatus:	Active

Facility ID:	FA0003651
Facility Status:	Active
Program Element Code:	2105
Program:	HAZMAT BUSINESS PLAN
Record Num:	PR0005709
District Code:	18
Decode for Fstatus:	Active

Facility ID:	FA0003651
Facility Status:	Active
Program Element Code:	2268
Program:	CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR
Record Num:	PR0009543
District Code:	18
Decode for Fstatus:	Active

A5 **CHEVRON-ROCKLIN** **UST** **U003786315**
SW **4211 SIERRA COLLEGE BLVD** **N/A**
< 1/8 **ROCKLIN, CA 95677**
0.028 mi.
150 ft. **Site 5 of 6 in cluster A**

Relative:
Lower

Actual:
335 ft.

UST:

Facility ID:	FA0003651
Permitting Agency:	PLACER COUNTY
Latitude:	38.808466
Longitude:	-121.203454

A6 SW < 1/8 0.028 mi. 150 ft. | **CHEVRON USA - SIERRA COLLEGE B** | **FINDS** | **1015925009**
4211 SIERRA COLLEGE BLVD | **ECHO** | **N/A**
ROCKLIN, CA 95677

Site 6 of 6 in cluster A

Relative: Lower

Actual: 335 ft.

FINDS:

Registry ID: 110054243029

Environmental Interest/Information System
AIR EMISSIONS CLASSIFICATION UNKNOWN

ECHO:
Envid: 1015925009
Registry ID: 110054243029
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110054243029

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7 NNW < 1/8 0.053 mi. 282 ft. | **HOMEWOOD LUMBER** | **CA PLACER CO. MS** | **S111226450**
4011 SIERRA COLLEGE BLVD | **N/A**
LOOMIS, CA 95650

Relative: Lower

Actual: 323 ft.

PLACER CO. MS:
Facility ID: FA0018363
Facility Status: Active
Program Element Code: 2105
Program: HAZMAT BUSINESS PLAN
Record Num: PR0015475
District Code: 58
Decode for Fstatus: Active

B8 SSW < 1/8 0.084 mi. 444 ft. | **7-ELEVEN INC.** | **LUST** | **S105982263**
4281 SIERRA COLLEGE BLVD | **CA PLACER CO. MS** | **N/A**
ROCKLIN, CA 95677

Site 1 of 4 in cluster B

Relative: Higher

Actual: 342 ft.

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 310400
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: PRS
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

PLACER CO. MS:
Facility ID: FA0004054
Facility Status: Active
Program Element Code: 2303
Program: UNDERGROUND STORAGE TANKS - 3 TANKS
Record Num: PR0006864

7-ELEVEN INC. (Continued) **S105982263**

District Code:	18
Decode for Fstatus:	Active
Facility ID:	FA0004054
Facility Status:	Active
Program Element Code:	2105
Program:	HAZMAT BUSINESS PLAN
Record Num:	PR0006866
District Code:	18
Decode for Fstatus:	Active
Facility ID:	FA0004054
Facility Status:	Active
Program Element Code:	2268
Program:	CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR
Record Num:	PR0009565
District Code:	18
Decode for Fstatus:	Active

B9
SSW
< 1/8
0.084 mi.
444 ft.

7-ELEVEN INC. **LUST** **S108196345**
4281 SIERRA COLLEGE BLVD **N/A**
ROCKLIN, CA 95677

Site 2 of 4 in cluster B

Relative:
Higher

Actual:
342 ft.

LUST:

Region:	STATE
Global Id:	T0606190594
Latitude:	38.806295697
Longitude:	-121.20501299
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	06/10/2008
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	PRS
Local Agency:	PLACER COUNTY
RB Case Number:	310400
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606190594
Contact Type:	Regional Board Caseworker
Contact Name:	PAUL SANDERS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	psanders@waterboards.ca.gov
Phone Number:	Not reported
Global Id:	T0606190594
Contact Type:	Local Agency Caseworker
Contact Name:	West Bourgault

7-ELEVEN INC. (Continued) **S108196345**

Organization Name: PLACER COUNTY
Address: 3091 County Center Drive, Suite 180
City: Auburn
Email: wbourgau@placer.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606190594
Status: Completed - Case Closed
Status Date: 06/10/2008

Global Id: T0606190594
Status: Open - Case Begin Date
Status Date: 08/01/2003

Global Id: T0606190594
Status: Open - Remediation
Status Date: 01/20/2005

Global Id: T0606190594
Status: Open - Site Assessment
Status Date: 09/17/2003

Global Id: T0606190594
Status: Open - Site Assessment
Status Date: 01/29/2004

Global Id: T0606190594
Status: Open - Site Assessment
Status Date: 06/29/2004

Global Id: T0606190594
Status: Open - Site Assessment
Status Date: 04/27/2007

Global Id: T0606190594
Status: Open - Site Assessment
Status Date: 07/31/2007

Global Id: T0606190594
Status: Open - Verification Monitoring
Status Date: 03/15/2007

Regulatory Activities:
Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 05/02/2007
Action: Staff Letter

Global Id: T0606190594
Action Type: RESPONSE
Date: 10/30/2003
Action: Other Report / Document

Global Id: T0606190594
Action Type: RESPONSE

7-ELEVEN INC. (Continued) **S108196345**

Date: 01/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 09/15/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: RESPONSE
Date: 02/29/2008
Action: Unknown

Global Id: T0606190594
Action Type: RESPONSE
Date: 03/19/2004
Action: Soil and Water Investigation Report

Global Id: T0606190594
Action Type: RESPONSE
Date: 04/15/2006
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 10/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 07/08/2004
Action: Staff Letter

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 02/24/2004
Action: Staff Letter

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 08/29/2005
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 03/15/2007
Action: Meeting

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 03/29/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 03/08/2007
Action: Staff Letter

7-ELEVEN INC. (Continued) **S108196345**

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 07/12/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 01/23/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: RESPONSE
Date: 07/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 04/15/2004
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: REMEDIATION
Date: 08/01/2003
Action: Other (Use Description Field)

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 10/17/2005
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: RESPONSE
Date: 10/15/2004
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 01/14/2004
Action: Warning Letter

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 01/19/2005
Action: * Historical Enforcement

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 10/30/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 03/07/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: ENFORCEMENT

7-ELEVEN INC. (Continued) **S108196345**

Date: 10/17/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: RESPONSE
Date: 10/15/2006
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 10/28/2004
Action: * Historical Enforcement

Global Id: T0606190594
Action Type: Other
Date: 08/01/2003
Action: Leak Discovery

Global Id: T0606190594
Action Type: Other
Date: 08/07/2003
Action: Leak Reported

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 07/27/2004
Action: * Historical Enforcement

Global Id: T0606190594
Action Type: RESPONSE
Date: 04/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 10/22/2004
Action: Soil and Water Investigation Report

Global Id: T0606190594
Action Type: RESPONSE
Date: 10/22/2004
Action: Interim Remedial Action Report

Global Id: T0606190594
Action Type: RESPONSE
Date: 01/15/2006
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 04/28/2005
Action: Technical Correspondence / Assistance / Other

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 05/09/2006
Action: Technical Correspondence / Assistance / Other

7-ELEVEN INC. (Continued) **S108196345**

Global Id: T0606190594
Action Type: RESPONSE
Date: 07/15/2007
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 07/15/2004
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 04/27/2007
Action: Soil and Water Investigation Workplan

Global Id: T0606190594
Action Type: RESPONSE
Date: 07/15/2006
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 01/15/2007
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 09/25/2003
Action: Staff Letter

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 05/13/2004
Action: Staff Letter

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 12/11/2007
Action: Staff Letter

Global Id: T0606190594
Action Type: Other
Date: 08/01/2003
Action: Leak Stopped

Global Id: T0606190594
Action Type: RESPONSE
Date: 03/19/2004
Action: Soil and Water Investigation Report

Global Id: T0606190594
Action Type: RESPONSE
Date: 07/02/2004
Action: Soil and Water Investigation Workplan

Global Id: T0606190594
Action Type: RESPONSE

7-ELEVEN INC. (Continued) **S108196345**

Date: 10/15/2007
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: RESPONSE
Date: 07/31/2007
Action: Soil and Water Investigation Report

Global Id: T0606190594
Action Type: RESPONSE
Date: 04/15/2007
Action: Monitoring Report - Quarterly

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 06/10/2008
Action: Closure/No Further Action Letter

Global Id: T0606190594
Action Type: ENFORCEMENT
Date: 07/13/2006
Action: Technical Correspondence / Assistance / Other

B10 **7-11 CONVENIENCE STORE #32636** **UST** **U003937245**
SSW **4281 SIERRA COLLEGE BLVD** **N/A**
< 1/8 **ROCKLIN, CA 95677**
0.084 mi.
444 ft. **Site 3 of 4 in cluster B**

Relative:
Higher

Actual:
342 ft.

UST:
Facility ID: FA0004054
Permitting Agency: PLACER COUNTY
Latitude: 38.8075867
Longitude: -121.2032329

B11 **7-ELEVEN INC #32636** **FINDS** **1016427993**
SSW **4281 SIERRA COLLEGE BLVD** **ECHO** **N/A**
< 1/8 **ROCKLIN, CA 95677**
0.086 mi.
456 ft. **Site 4 of 4 in cluster B**

Relative:
Higher

Actual:
340 ft.

FINDS:

Registry ID: 110055780944

Environmental Interest/Information System
STATE MASTER

ECHO:
Envid: 1016427993
Registry ID: 110055780944
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110055780944

12 SSW < 1/8 0.111 mi. 588 ft. | **ARCO AMPM**
4280 SIERRA COLLEGE BLVD
ROCKLIN, CA 95677 | **CA PLACER CO. MS**
NPDES | **S115950481**
N/A

Relative: Lower

Actual: 331 ft.

PLACER CO. MS:

Facility ID:	FA0019746
Facility Status:	Active
Program Element Code:	2105
Program:	HAZMAT BUSINESS PLAN
Record Num:	PR0016851
District Code:	18
Decode for Fstatus:	Active

Facility ID:	FA0019746
Facility Status:	Active
Program Element Code:	2303
Program:	UNDERGROUND STORAGE TANKS - 3 TANKS
Record Num:	PR0016853
District Code:	18
Decode for Fstatus:	Active

Facility ID:	FA0019746
Facility Status:	Active
Program Element Code:	2268
Program:	CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR
Record Num:	PR0016855
District Code:	18
Decode for Fstatus:	Active

NPDES:

Npdes Number:	CAS000002
Facility Status:	Terminated
Agency Id:	0
Region:	5S
Regulatory Measure Id:	444265
Order No:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S31C368899
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	02/10/2014
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	04/04/2015
Discharge Name:	G & H Bains Inc
Discharge Address:	4280 Sierra College Blvd
Discharge City:	Rocklin
Discharge State:	California
Discharge Zip:	95677
RECEIVED DATE:	Not reported
PROCESSED DATE:	Not reported
STATUS CODE NAME:	Not reported
STATUS DATE:	Not reported
PLACE SIZE:	Not reported
PLACE SIZE UNIT:	Not reported
FACILITY CONTACT NAME:	Not reported
FACILITY CONTACT TITLE:	Not reported

ARCO AMPM (Continued) **S115950481**

FACILITY CONTACT PHONE:	Not reported
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	Not reported
OPERATOR NAME:	Not reported
OPERATOR ADDRESS:	Not reported
OPERATOR CITY:	Not reported
OPERATOR STATE:	Not reported
OPERATOR ZIP:	Not reported
OPERATOR CONTACT NAME:	Not reported
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	Not reported
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	Not reported
OPERATOR TYPE:	Not reported
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	Not reported
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Not reported
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	Not reported
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported

C13 WNW 1/8-1/4 0.133 mi. 703 ft. | **SHAMROCK PUMP & EQUIPMENT**
3985 TAYLOR RD (AKA: 4175)
LOOMIS, CA 95650

Site 1 of 4 in cluster C

LUST | **S104403241**
N/A

Relative: Lower

Actual: 319 ft.

LUST:

Region:	STATE
Global Id:	T0606100075
Latitude:	38.8122042
Longitude:	-121.205444
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/07/2002
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	PRS
Local Agency:	PLACER COUNTY
RB Case Number:	310091
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606100075
Contact Type:	Regional Board Caseworker
Contact Name:	PAUL SANDERS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	psanders@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606100075
Contact Type:	Local Agency Caseworker
Contact Name:	WEST BOURGAULT
Organization Name:	PLACER COUNTY
Address:	3091 County Center Drive, Suite 180
City:	AUBURN
Email:	wbourgau@placer.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606100075
Status:	Completed - Case Closed
Status Date:	05/07/2002

Global Id:	T0606100075
Status:	Open - Case Begin Date
Status Date:	06/27/1990

Global Id:	T0606100075
Status:	Open - Site Assessment
Status Date:	08/02/2000

SHAMROCK PUMP & EQUIPMENT (Continued) **S104403241**

Regulatory Activities:

Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	06/09/2000
Action:	Staff Letter
Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	08/20/2001
Action:	Staff Letter
Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	12/11/2000
Action:	Staff Letter
Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	05/30/2000
Action:	Staff Letter
Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	05/07/2002
Action:	Closure/No Further Action Letter
Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	05/07/2002
Action:	Closure/No Further Action Letter
Global Id:	T0606100075
Action Type:	Other
Date:	06/27/1990
Action:	Leak Reported
Global Id:	T0606100075
Action Type:	ENFORCEMENT
Date:	06/09/2000
Action:	* Historical Enforcement

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	310091
Case Type:	Drinking Water Aquifer affected
Substance:	GASOLINE
Staff Initials:	PRS
Lead Agency:	Regional
Program:	LUST
MTBE Code:	0

C14
WNW
1/8-1/4
0.141 mi.
746 ft.

EDR Hist Auto **1015466587**
N/A

3985 TAYLOR RD
LOOMIS, CA 95650

Site 2 of 4 in cluster C

Relative:
Lower

Actual:
319 ft.

EDR Historical Auto Stations:

Name: AUTO TEC
Year: 2001
Address: 3985 TAYLOR RD

Name: AUTO TEC
Year: 2002
Address: 3985 TAYLOR RD

Name: AUTO TEC
Year: 2003
Address: 3985 TAYLOR RD

Name: AUTO TEC
Year: 2004
Address: 3985 TAYLOR RD

Name: AUTO TEC
Year: 2006
Address: 3985 TAYLOR RD

Name: AUTO TEE
Year: 2008
Address: 3985 TAYLOR RD

Name: AUTO TEC
Year: 2009
Address: 3985 TAYLOR RD

Name: AUTOTEC
Year: 2010
Address: 3985 TAYLOR RD

Name: AUTO TEC
Year: 2011
Address: 3985 TAYLOR RD

C15
WNW
1/8-1/4
0.141 mi.
746 ft.

AUTO-TEC **CA PLACER CO. MS** **S102852689**
N/A

3985 TAYLOR RD
LOOMIS, CA 95650

Site 3 of 4 in cluster C

Relative:
Lower

Actual:
319 ft.

PLACER CO. MS:

Facility ID: FA0003942
Facility Status: Active
Program Element Code: 2105
Program: HAZMAT BUSINESS PLAN
Record Num: PR0006486
District Code: 58
Decode for Fstatus: Active

Facility ID: FA0003942
Facility Status: Active

AUTO-TEC (Continued) **S102852689**

Program Element Code: 2270
Program: SMALL QUANTITY GENERATOR
Record Num: PR0006988
District Code: 58
Decode for Fstatus: Active

D16
SSW
1/8-1/4
0.143 mi.
754 ft.

CHEVRON #6705 CLOSED **SWEEPS UST** **S103659567**
4365 SIERRA COLLEGE BLVD **CA PLACER CO. MS** **N/A**
ROCKLIN, CA 95677

Site 1 of 5 in cluster D

Relative:
Higher

Actual:
338 ft.

SWEEPS UST:
Status: Active
Comp Number: 491
Number: 2
Board Of Equalization: 44-031913
Referral Date: 09-16-93
Action Date: 03-11-94
Created Date: 06-30-93
Owner Tank Id: 1
SWRCB Tank Id: 31-000-000491-000001
Tank Status: A
Capacity: 10000
Active Date: 09-16-93
Tank Use: M.V. FUEL
STG: P
Content: PRM UNLEADED
Number Of Tanks: 4

Status: Active
Comp Number: 491
Number: 2
Board Of Equalization: 44-031913
Referral Date: 09-16-93
Action Date: 03-11-94
Created Date: 06-30-93
Owner Tank Id: 2
SWRCB Tank Id: 31-000-000491-000002
Tank Status: A
Capacity: 4000
Active Date: 09-16-93
Tank Use: M.V. FUEL
STG: P
Content: PLUS UNLEADE
Number Of Tanks: Not reported

Status: Active
Comp Number: 491
Number: 2
Board Of Equalization: 44-031913
Referral Date: 09-16-93
Action Date: 03-11-94
Created Date: 06-30-93
Owner Tank Id: 3
SWRCB Tank Id: 31-000-000491-000003
Tank Status: A
Capacity: 10000

CHEVRON #6705 CLOSED (Continued) **S103659567**

Active Date:	09-16-93
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	491
Number:	2
Board Of Equalization:	44-031913
Referral Date:	09-16-93
Action Date:	03-11-94
Created Date:	06-30-93
Owner Tank Id:	4
SWRCB Tank Id:	31-000-000491-000004
Tank Status:	A
Capacity:	1000
Active Date:	09-16-93
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

PLACER CO. MS:

Facility ID:	FA0000491
Facility Status:	Closed
Program Element Code:	2304
Program:	UNDERGROUND STORAGE TANKS - 4 TANKS
Record Num:	PR0000517
District Code:	18
Decode for Fstatus:	Closed

Facility ID:	FA0000491
Facility Status:	Closed
Program Element Code:	2112
Program:	AS/US HAZMAT-NO WASTE, =>20,000/MONTH
Record Num:	PR0002897
District Code:	18
Decode for Fstatus:	Closed

D17 **CHEVRON #9-6705** **LUST** **S102427045**
SSW **4365 SIERRA COLLEGE BLVD** **SWEEPS UST** **N/A**
1/8-1/4 **LOOMIS, CA 95650** **HIST CORTESE**
0.143 mi.
754 ft. **Site 2 of 5 in cluster D**

Relative:
Higher

Actual:
338 ft.

LUST:

Region:	STATE
Global Id:	T0606100025
Latitude:	38.805119239
Longitude:	-121.205162376
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/18/2004
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	PRS
Local Agency:	PLACER COUNTY

CHEVRON #9-6705 (Continued) **S102427045**

RB Case Number: 310031
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606100025
Contact Type: Regional Board Caseworker
Contact Name: PAUL SANDERS
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: psanders@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606100025
Contact Type: Local Agency Caseworker
Contact Name: WEST BOURGAULT
Organization Name: PLACER COUNTY
Address: 3091 County Center Drive, Suite 180
City: AUBURN
Email: wbourgau@placer.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606100025
Status: Completed - Case Closed
Status Date: 05/18/2004

Global Id: T0606100025
Status: Open - Case Begin Date
Status Date: 03/23/1988

Global Id: T0606100025
Status: Open - Site Assessment
Status Date: 04/02/1992

Global Id: T0606100025
Status: Open - Verification Monitoring
Status Date: 10/27/2003

Regulatory Activities:
Global Id: T0606100025
Action Type: RESPONSE
Date: 01/30/2004
Action: Other Report / Document

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 12/09/2002
Action: Staff Letter

Global Id: T0606100025

CHEVRON #9-6705 (Continued) **S102427045**

Action Type: ENFORCEMENT
Date: 02/07/2003
Action: Staff Letter

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 10/17/2000
Action: Staff Letter

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 11/29/2000
Action: Staff Letter

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 10/22/2001
Action: Staff Letter

Global Id: T0606100025
Action Type: RESPONSE
Date: 07/30/2004
Action: Unknown

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 02/25/2004
Action: Staff Letter

Global Id: T0606100025
Action Type: Other
Date: 03/23/1988
Action: Leak Reported

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 10/29/2003
Action: * Historical Enforcement

Global Id: T0606100025
Action Type: RESPONSE
Date: 01/31/2003
Action: Soil and Water Investigation Workplan

Global Id: T0606100025
Action Type: RESPONSE
Date: 04/30/2003
Action: Soil and Water Investigation Report

Global Id: T0606100025
Action Type: RESPONSE
Date: 10/31/2003
Action: Monitoring Report - Quarterly

Global Id: T0606100025
Action Type: RESPONSE
Date: 01/30/2004

CHEVRON #9-6705 (Continued) **S102427045**

Action: Other Report / Document

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 11/18/2003
Action: Warning Letter

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 05/18/2004
Action: Closure/No Further Action Letter

Global Id: T0606100025
Action Type: ENFORCEMENT
Date: 07/21/2003
Action: Staff Letter

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 310031
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: PRS
Lead Agency: Regional
Program: LUST
MTBE Code: 3

SWEEPS UST:
Status: Active
Comp Number: 62907
Number: 9
Board Of Equalization: 44-017339
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 1
SWRCB Tank Id: 31-000-062907-000001
Tank Status: A
Capacity: 10000
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: P
Content: Not reported
Number Of Tanks: 4

Status: Active
Comp Number: 62907
Number: 9
Board Of Equalization: 44-017339
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 2
SWRCB Tank Id: 31-000-062907-000002

CHEVRON #9-6705 (Continued) **S102427045**

Tank Status:	A
Capacity:	5000
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	P
Content:	Not reported
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	62907
Number:	9
Board Of Equalization:	44-017339
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	3
SWRCB Tank Id:	31-000-062907-000003
Tank Status:	A
Capacity:	10000
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	P
Content:	Not reported
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	62907
Number:	9
Board Of Equalization:	44-017339
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	4
SWRCB Tank Id:	31-000-062907-000004
Tank Status:	A
Capacity:	1000
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	W
Content:	Not reported
Number Of Tanks:	Not reported

HIST CORTESE:

Region:	CORTESE
Facility County Code:	31
Reg By:	LTNKA
Reg Id:	310031

D18 SSW 1/8-1/4 0.143 mi. 754 ft. | **96705**
4365 SIERRA COLLEGE BLV
LOOMIS, CA 95650

Site 3 of 5 in cluster D

HIST UST | **U001613240**
N/A

Relative: Higher

Actual: 338 ft.

HIST UST:

File Number:	0001F1AA
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F1AA.pdf
Region:	STATE
Facility ID:	00000062907
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	MONTGOMERY,JACK
Telephone:	9166527474
Owner Name:	CHEVRON U.S.A. INC.
Owner Address:	575 MARKET
Owner City,St,Zip:	SAN FRANCISCO, CA 94105
Total Tanks:	0004
Tank Num:	001
Container Num:	1
Year Installed:	1967
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	0000250
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	2
Year Installed:	1967
Tank Capacity:	00005000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	0000250
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	3
Year Installed:	1967
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	0000250
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	4
Year Installed:	1967
Tank Capacity:	00001000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	0000130
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

19 NNE 1/8-1/4 0.159 mi. 841 ft. | **KOA, LOOMIS**
3945 TAYLOR RD
LOOMIS, CA 95650 | **CA PLACER CO. MS** | **S105982334**
N/A

Relative: Higher

Actual: 336 ft.

PLACER CO. MS:

Facility ID:	FA0001712
Facility Status:	Closed
Program Element Code:	2105
Program:	HAZMAT BUSINESS PLAN
Record Num:	PR0002479
District Code:	999
Decode for Fstatus:	Closed

Facility ID:	FA0008513
Facility Status:	Active
Program Element Code:	2105
Program:	HAZMAT BUSINESS PLAN
Record Num:	PR0009181
District Code:	58
Decode for Fstatus:	Active

D20 SSW 1/8-1/4 0.160 mi. 844 ft. | **HIGHBRIDGE RANCH**
4436 SIERRA COLLEGE BLVD
LOOMIS, CA 95650 | **SWEEPS UST**
HIST UST | **U001613257**
N/A

Site 4 of 5 in cluster D

Relative: Higher

Actual: 339 ft.

SWEEPS UST:

Status:	Active
Comp Number:	44925
Number:	9
Board Of Equalization:	Not reported
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	31-000-044925-000001
Tank Status:	A
Capacity:	550
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	1

HIST UST:

File Number:	0001F2CD
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F2CD.pdf
Region:	STATE
Facility ID:	00000044925
Facility Type:	Other
Other Type:	FARM
Contact Name:	MILTON TAKAHASHI
Telephone:	9166526342
Owner Name:	MILTON TAKAHASHI
Owner Address:	4436 SIERRA COLLEGE BLVD.
Owner City,St,Zip:	LOOMIS, CA 95650

HIGHBRIDGE RANCH (Continued) **U001613257**

Total Tanks: 0001

Tank Num: 001
Container Num: 1
Year Installed: 1950
Tank Capacity: 00000550
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: None

Click here for Geo Tracker PDF:

C21 WNW 1/8-1/4 0.162 mi. 857 ft. **VALLEY ROCK (LOOMIS)** **SLIC** **S103717013**
4018 TAYLOR RD **CA PLACER CO. MS** **N/A**
LOOMIS, CA 95650

Site 4 of 4 in cluster C

Relative: Lower

Actual: 322 ft.

SLIC:
Region: STATE
Facility Status: Open - Inactive
Status Date: 06/30/2009
Global Id: SLT5SB163554
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: Not reported
Latitude: 38.8264808
Longitude: -121.1904195
Case Type: Cleanup Program Site
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: SLT5SB16
File Location: Not reported
Potential Media Affected: Not reported
Potential Contaminants of Concern: Not reported
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

PLACER CO. MS:
Facility ID: FA0004231
Facility Status: Active
Program Element Code: 2105
Program: HAZMAT BUSINESS PLAN
Record Num: PR0007194
District Code: 58
Decode for Fstatus: Active

Facility ID: FA0004231
Facility Status: Active
Program Element Code: 2268
Program: CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR
Record Num: PR0007497
District Code: 58
Decode for Fstatus: Active

D22 SSW 1/8-1/4 0.170 mi. 899 ft. | **TARGET STORE T2604 5104 COMMONS DR ROCKLIN, CA 95677** | **RCRA-SQG FINDS ECHO** | **1016453007 CAR000244020**

Site 5 of 5 in cluster D

Relative: Higher

Actual: 337 ft.

RCRA-SQG:

Date form received by agency:	02/11/2014
Facility name:	TARGET STORE T2604
Facility address:	5104 COMMONS DR ROCKLIN, CA 95677
EPA ID:	CAR000244020
Mailing address:	PO BOX 111 MINNEAPOLIS, MN 55440
Contact:	STEVE MUSSER
Contact address:	PO BOX 111 MINNEAPOLIS, MN 55440
Contact country:	US
Contact telephone:	800-587-2228
Contact email:	POC@TARGET.COM
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	TARGET CORP
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	03/05/2014
Owner/Op end date:	Not reported

Owner/operator name:	TARGET CORP
Owner/operator address:	PO BOX 111 MINNEAPOLIS, MN 55440
Owner/operator country:	US
Owner/operator telephone:	800-587-2228
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	03/05/2014
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No

TARGET STORE T2604 (Continued) **1016453007**

Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: 221
. Waste name: 221

. Waste code: 311
. Waste name: 311

. Waste code: 331
. Waste name: 331

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

. Waste code: D010
. Waste name: SELENIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: D016
. Waste name: 2,4-D (2,4-DICHLOROPHENOXYACETIC ACID)

. Waste code: D018
. Waste name: BENZENE

. Waste code: D024
. Waste name: M-CRESOL

. Waste code: D026

TARGET STORE T2604 (Continued) **1016453007**

. Waste name: CRESOL

. Waste code: D028
. Waste name: 1,2-DICHLOROETHANE

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: P001
. Waste name: 2H-1-BENZOPYRAN-2-ONE, 4-HYDROXY-3-(3-OXO-1-PHENYLBUTYL)-, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3% (OR) WARFARIN, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3%

. Waste code: P046
. Waste name: ALPHA,ALPHA-DIMETHYLPHENETHYLAMINE (OR) BENZENEETHANAMINE, ALPHA, ALPHA-DIMETHYL-

. Waste code: P075
. Waste name: NICOTINE, & SALTS (OR) PYRIDINE, 3-(1-METHYL-2-PYRROLIDINYL)-,(S)-, & SALTS

. Waste code: P081
. Waste name: 1,2,3-PROPANETRIOL, TRINITRATE (R) (OR) NITROGLYCERINE (R)

. Waste code: U002
. Waste name: 2-PROPANONE (I) (OR) ACETONE (I)

. Waste code: U035
. Waste name: BENZENEBUTANOIC ACID, 4-[BIS(2-CHLOROETHYL)AMINO]- (OR) CHLORAMBUCIL

. Waste code: U044
. Waste name: CHLOROFORM (OR) METHANE, TRICHLORO-

. Waste code: U058
. Waste name: 2H-1,3,2-OXAZAPHOSPHORIN-2-AMINE, N,N-BIS(2-CHLOROETHYL)TETRAHYDRO-, 2-OXIDE (OR) CYCLOPHOSPHAMIDE

. Waste code: U072
. Waste name: BENZENE, 1,4-DICHLORO- (OR) P-DICHLOROBENZENE

. Waste code: U122
. Waste name: FORMALDEHYDE

. Waste code: U129
. Waste name: CYCLOHEXANE, 1,2,3,4,5,6-HEXACHLORO-, (1ALPHA, 2ALPHA, 3BETA, 4ALPHA, 5ALPHA, 6BETA)- (OR) LINDANE

. Waste code: U150
. Waste name: L-PHENYLALANINE, 4-[BIS(2-CHLOROETHYL)AMINO]- (OR) MELPHALAN

. Waste code: U154
. Waste name: METHANOL (I) (OR) METHYL ALCOHOL (I)

. Waste code: U188
. Waste name: PHENOL

. Waste code: U200

TARGET STORE T2604 (Continued) **1016453007**

. Waste name: RESERPINE (OR) YOHIMBAN-16-CARBOXYLIC ACID, 11,17-DIMETHOXY-18-[(3,4,5-TRIMETHOXYBENZOYL)OXY]-, METHYL ESTER, (3BETA, 16BETA, 17ALPHA, 18BETA, 20ALPHA)-

. Waste code: U201
. Waste name: 1,3-BENZENEDIOL (OR) RESORCINOL

. Waste code: U279
. Waste name: CARBARYL (OR) 1-NAPHTHALENOL, METHYLCARBAMATE

Violation Status: No violations found

FINDS:

Registry ID: 110058882311

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

ECHO:
Envid: 1016453007
Registry ID: 110058882311
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110058882311

E23 **FOREST PRODUCTS MANUFACTURING** **SLIC** **S106486453**
West **PACIFIC STREET, INDUSTRIAL PARK, LOT 5** **N/A**
1/8-1/4 **ROCKLIN, CA**
0.174 mi.
921 ft. **Site 1 of 2 in cluster E**

Relative:
Lower

Actual:
317 ft.

SLIC:
Region: STATE
Facility Status: **Completed - Case Closed**
Status Date: 10/15/1993
Global Id: SLT5S1393179
Lead Agency: DEPARTMENT OF TOXIC SUBSTANCES CONTROL
Lead Agency Case Number: Not reported
Latitude: 38.8034690550069
Longitude: -121.216938322815
Case Type: Cleanup Program Site
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: SLT5S139
File Location: DTSC
Potential Media Affected: Under Investigation
Potential Contaminants of Concern: Not reported
Site History: Forest Products Company is a wood product coating facility which operated at the Site since 1977. In 1980, the company built two unlined evaporation ponds to handle thier waste stream. When the ponds were dry, the bottom of the ponds were scraped, and the scrapings placed into 55-gallon drums. In 1983, Forest Product conducted a cleanup of the ponds for mercury and lead and in 1986 the

FOREST PRODUCTS MANUFACTURING (Continued) **S106486453**

Department of Health Services (DHS) concurred the cleanup was adequate. In 1990, Simas Enterprises purchased the property. In 1987, DHS conducted a drive-by of the Site and observed soil contamination from recent discharges to a drainage ditch and recommended a full site inspection. Department of Toxic Substances Control (DTSC) oversaw the investigation and remediation of the Site. On 15 October 1993, DTSC notified Simas that the residual soil and groundwater contamination do not pose a risk to human health or the environment. More information can be found at the DTSC Envirostor website (http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=31240008)

Click here to access the California GeoTracker records for this facility:

E24
WNW
1/8-1/4
0.180 mi.
951 ft.

MC CONCEPTS LLC
4013 TAYLOR RD
LOOMIS, CA 95650

HAZNET **S113118130**
CA PLACER CO. MS **N/A**

Site 2 of 2 in cluster E

Relative:
Lower

Actual:
315 ft.

HAZNET:

envid:	S113118130
Year:	2011
GEPAID:	CAL000248523
Contact:	ESTER HATCH
Telephone:	9166524985
Mailing Name:	Not reported
Mailing Address:	4013 TAYLOR RD
Mailing City,St,Zip:	LOOMIS, CA 95650
Gen County:	Not reported
TSD EPA ID:	CA0000084517
TSD County:	Not reported
Waste Category:	Halogenated solvents (chloroforms, methyl chloride, perchloroethylene, etc)
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.02
Cat Decode:	Halogenated solvents (chloroforms, methyl chloride, perchloroethylene, etc)
Method Decode:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County:	Placer

envid:	S113118130
Year:	2011
GEPAID:	CAL000248523
Contact:	ESTER HATCH
Telephone:	9166524985
Mailing Name:	Not reported
Mailing Address:	4013 TAYLOR RD
Mailing City,St,Zip:	LOOMIS, CA 95650
Gen County:	Not reported
TSD EPA ID:	TXD077603371
TSD County:	Not reported
Waste Category:	Halogenated solvents (chloroforms, methyl chloride, perchloroethylene, etc)
Disposal Method:	Fuel Blending Prior To Energy Recovery At Another Site
Tons:	0.1155
Cat Decode:	Halogenated solvents (chloroforms, methyl chloride, perchloroethylene, etc)

MC CONCEPTS LLC (Continued) **S113118130**

Method Decode: Fuel Blending Prior To Energy Recovery At Another Site
Facility County: Placer

envid: S113118130
Year: 2010
GEPAID: CAL000248523
Contact: ESTER HATCH
Telephone: 9166524985
Mailing Name: Not reported
Mailing Address: 4013 TAYLOR RD
Mailing City,St,Zip: LOOMIS, CA 95650
Gen County: Not reported
TSD EPA ID: TXD077603371
TSD County: Not reported
Waste Category: Halogenated solvents (chloroforms, methyl chloride, perchloroethylene, etc)
Disposal Method: Fuel Blending Prior To Energy Recovery At Another Site
Tons: 0.308
Cat Decode: Halogenated solvents (chloroforms, methyl chloride, perchloroethylene, etc)
Method Decode: Fuel Blending Prior To Energy Recovery At Another Site
Facility County: Placer

PLACER CO. MS:
Facility ID: FA0019936
Facility Status: Active
Program Element Code: 2105
Program: HAZMAT BUSINESS PLAN
Record Num: PR0017013
District Code: 58
Decode for Fstatus: Active

Facility ID: FA0019936
Facility Status: Active
Program Element Code: 2270
Program: SMALL QUANTITY GENERATOR
Record Num: PR0017014
District Code: 58
Decode for Fstatus: Active

---

25 **EDR Hist Auto** **1015496278**
SSW **4390 SIERRA COLLEGE BLVD** **N/A**
1/8-1/4 **ROCKLIN, CA 95677**
0.195 mi.
1028 ft.

Relative:
Higher

Actual:
340 ft.

EDR Historical Auto Stations:
Name: SIERRA COLLEGE UNION STATION
Year: 1999
Address: 4390 SIERRA COLLEGE BLVD

Name: SIERRA COLLEGE UNION STATION
Year: 2000
Address: 4390 SIERRA COLLEGE BLVD

Name: SIERRA COLLEGE UNION 76
Year: 2005
Address: 4390 SIERRA COLLEGE BLVD

(Continued) **1015496278**

Name: CONOCOPHILLIPS
Year: 2008
Address: 4390 SIERRA COLLEGE BLVD

---

26 NW 1/8-1/4 0.209 mi. 1105 ft.

DEL MAR HEADQUARTERS
3930 SIERRA COLLEGE BLVD
LOOMIS, CA 95650

RCRA-SQG **1000123700**
FINDS **CAD982501686**
CA PLACER CO. MS
ECHO

Relative: Lower

Actual: 326 ft.

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: DEL MAR HEADQUARTERS
Facility address: 3930 SIERRA COLLEGE BLVD
LOOMIS, CA 95650
EPA ID: CAD982501686
Mailing address: SIERRA COLLEGE BLVD
LOOMIS, CA 95650
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: DONALD ARNOLD
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No

DEL MAR HEADQUARTERS (Continued) **1000123700**

Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110002834130

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Registry ID: 110059738510

Environmental Interest/Information System
STATE MASTER

PLACER CO. MS:
Facility ID: FA0001929
Facility Status: Active
Program Element Code: 2105
Program: HAZMAT BUSINESS PLAN
Record Num: PR0002704
District Code: 58
Decode for Fstatus: Active

Facility ID: FA0001929
Facility Status: Active
Program Element Code: 2270
Program: SMALL QUANTITY GENERATOR
Record Num: PR0008024
District Code: 58
Decode for Fstatus: Active

ECHO:
Envid: 1000123700
Registry ID: 110059738510
DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110059738510

Envid: 1000123700
Registry ID: 110002834130

DEL MAR HEADQUARTERS (Continued) **1000123700**

DFR URL: http://echo.epa.gov/detailed_facility_report?fid=110002834130

27
West
1/4-1/2
0.261 mi.
1377 ft.

PEARSON AUTOMOTIVE SERVICE
4175 TAYLOR RD
LOOMIS, CA 95650

HIST CORTESE **S100224987**
CA PLACER CO. MS **N/A**

Relative:
Lower

Actual:
320 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	31
Reg By:	LTNKA
Reg Id:	310091

PLACER CO. MS:

Facility ID:	FA0000809
Facility Status:	Closed
Program Element Code:	2302
Program:	UNDERGROUND STORAGE TANKS - 2 TANKS
Record Num:	PR0001291
District Code:	999
Decode for Fstatus:	Closed

Facility ID:	FA0000809
Facility Status:	Closed
Program Element Code:	2105
Program:	HAZMAT BUSINESS PLAN
Record Num:	PR0003621
District Code:	999
Decode for Fstatus:	Closed

28
NNW
1/4-1/2
0.276 mi.
1458 ft.

SAMUEL E. ROSE & BETTY A. ROSE
3921 SIERRA COLLEGE BLVD
LOOMIS, CA 95650

SWEEPS UST **U001613277**
HIST UST **N/A**

Relative:
Lower

Actual:
323 ft.

SWEEPS UST:

Status:	Active
Comp Number:	46427
Number:	9
Board Of Equalization:	Not reported
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	#1
SWRCB Tank Id:	31-000-046427-000001
Tank Status:	A
Capacity:	550
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	1

SAMUEL E. ROSE & BETTY A. ROSE (Continued) **U001613277**

HIST UST:

File Number:	0001F369
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F369.pdf
Region:	STATE
Facility ID:	00000046427
Facility Type:	Other
Other Type:	Not reported
Contact Name:	Not reported
Telephone:	9166527258
Owner Name:	SAMUEL E. ROSE & BETTY A. ROSE
Owner Address:	3921 SIERRA COLLEGE BLVD.
Owner City,St,Zip:	LOOMIS, CA 95650
Total Tanks:	0001
Tank Num:	001
Container Num:	#1
Year Installed:	1975
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None

Click here for Geo Tracker PDF:

F29 **SS #6008 (FORMER UNOCAL)** **LUST** **S103993545**
SW **4390 SIERRA COLLEGE** **SWEEPS UST** **N/A**
1/4-1/2 **ROCKLIN, CA 95677** **HIST CORTESE**
0.301 mi. **CA PLACER CO. MS**
1590 ft. **Site 1 of 3 in cluster F**

Relative:
Lower

Actual:
327 ft.

LUST:

Region:	STATE
Global Id:	T0606100283
Latitude:	38.805233023
Longitude:	-121.206015384
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	02/09/2007
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	PRS
Local Agency:	PLACER COUNTY
RB Case Number:	310341
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606100283
Contact Type:	Regional Board Caseworker
Contact Name:	PAUL SANDERS
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA

SS #6008 (FORMER UNOCAL) (Continued) **S103993545**

Email: psanders@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606100283
Contact Type: Local Agency Caseworker
Contact Name: WEST BOURGAULT
Organization Name: PLACER COUNTY
Address: 3091 County Center Drive, Suite 180
City: AUBURN
Email: wbourgau@placer.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606100283
Status: Completed - Case Closed
Status Date: 02/09/2007

Global Id: T0606100283
Status: Open - Case Begin Date
Status Date: 09/18/1997

Global Id: T0606100283
Status: Open - Site Assessment
Status Date: 09/18/1997

Global Id: T0606100283
Status: Open - Site Assessment
Status Date: 05/10/2000

Global Id: T0606100283
Status: Open - Verification Monitoring
Status Date: 09/15/2000

Regulatory Activities:
Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 10/17/2000
Action: Staff Letter

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 02/05/2001
Action: Staff Letter

Global Id: T0606100283
Action Type: RESPONSE
Date: 10/15/2003
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 06/17/2002
Action: Staff Letter

Global Id: T0606100283
Action Type: RESPONSE

SS #6008 (FORMER UNOCAL) (Continued) **S103993545**

Date: 04/15/2004
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 03/13/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606100283
Action Type: RESPONSE
Date: 04/15/2006
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: RESPONSE
Date: 10/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 11/30/2000
Action: Staff Letter

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 12/08/2005
Action: Technical Correspondence / Assistance / Other

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 08/16/2002
Action: Staff Letter

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 10/28/2004
Action: Technical Correspondence / Assistance / Other

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 06/17/2005
Action: Technical Correspondence / Assistance / Other

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 12/13/2006
Action: Staff Letter

Global Id: T0606100283
Action Type: Other
Date: 09/18/1997
Action: Leak Discovery

Global Id: T0606100283
Action Type: Other
Date: 02/04/1998
Action: Leak Reported

SS #6008 (FORMER UNOCAL) (Continued) **S103993545**

Global Id: T0606100283
Action Type: RESPONSE
Date: 04/15/2005
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: RESPONSE
Date: 10/15/2002
Action: Tank Removal Report / UST Sampling Report

Global Id: T0606100283
Action Type: RESPONSE
Date: 10/28/2004
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: RESPONSE
Date: 10/15/2006
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: RESPONSE
Date: 09/08/2006
Action: Other Workplan

Global Id: T0606100283
Action Type: RESPONSE
Date: 02/28/2007
Action: Unknown

Global Id: T0606100283
Action Type: RESPONSE
Date: 01/15/2007
Action: Soil and Water Investigation Report

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 04/03/2003
Action: * Historical Enforcement

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 07/18/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0606100283
Action Type: RESPONSE
Date: 04/15/2003
Action: Monitoring Report - Quarterly

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 10/17/2000
Action: * Historical Enforcement

Global Id: T0606100283
Action Type: ENFORCEMENT

SS #6008 (FORMER UNOCAL) (Continued) **S103993545**

Date: 07/19/2006
Action: Staff Letter

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 05/18/2004
Action: Technical Correspondence / Assistance / Other

Global Id: T0606100283
Action Type: ENFORCEMENT
Date: 10/14/2003
Action: * Historical Enforcement

SWEEPS UST:
Status: Active
Comp Number: 953
Number: 2
Board Of Equalization: Not reported
Referral Date: 05-22-91
Action Date: 05-22-91
Created Date: 05-22-91
Owner Tank Id: 6008-RU-1
SWRCB Tank Id: 31-000-000953-000001
Tank Status: A
Capacity: 10000
Active Date: 05-22-91
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: 4

Status: Active
Comp Number: 953
Number: 2
Board Of Equalization: Not reported
Referral Date: 05-22-91
Action Date: 05-22-91
Created Date: 05-22-91
Owner Tank Id: 6008-SU-1
SWRCB Tank Id: 31-000-000953-000002
Tank Status: A
Capacity: 10000
Active Date: 05-22-91
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: Not reported

Status: Active
Comp Number: 953
Number: 2
Board Of Equalization: Not reported
Referral Date: 05-22-91
Action Date: 05-22-91
Created Date: 05-22-91
Owner Tank Id: 6008-DSL-1

SS #6008 (FORMER UNOCAL) (Continued) **S103993545**

SWRCB Tank Id:	31-000-000953-000003
Tank Status:	A
Capacity:	10000
Active Date:	05-22-91
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	953
Number:	2
Board Of Equalization:	Not reported
Referral Date:	05-22-91
Action Date:	05-22-91
Created Date:	05-22-91
Owner Tank Id:	6008-WO-1
SWRCB Tank Id:	31-000-000953-000004
Tank Status:	A
Capacity:	280
Active Date:	05-22-91
Tank Use:	OIL
STG:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

HIST CORTESE:

Region:	CORTESE
Facility County Code:	31
Reg By:	LTNKA
Reg Id:	310341

PLACER CO. MS:

Facility ID:	FA0008462
Facility Status:	Closed
Program Element Code:	2111
Program:	AS/US HAZMAT-NO WASTE <20,000/MONTH
Record Num:	PR0003171
District Code:	18
Decode for Fstatus:	Closed

Facility ID:	FA0008462
Facility Status:	Closed
Program Element Code:	2270
Program:	SMALL QUANTITY GENERATOR
Record Num:	PR0007388
District Code:	18
Decode for Fstatus:	Closed

F30 SW 1/4-1/2 0.301 mi. 1590 ft. | **SS #6008 (FORMER UNOCAL)** | **LUST** | **S103286246**
4390 SIERRA COLLEGE BLVD | **N/A**
ROCKLIN, CA 95677

Site 2 of 3 in cluster F

Relative: Lower

Actual: 327 ft.

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	310341
Case Type:	Drinking Water Aquifer affected
Substance:	GASOLINE
Staff Initials:	PRS
Lead Agency:	Regional
Program:	LUST
MTBE Code:	3

F31 SW 1/4-1/2 0.301 mi. 1590 ft. | **UNION OIL SS 6008** | **HIST UST** | **U001613280**
4390 SIERRA COLLEGE BLVD | **N/A**
LOOMIS, CA 95650

Site 3 of 3 in cluster F

Relative: Lower

Actual: 327 ft.

HIST UST:

File Number:	0001F3DA
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F3DA.pdf
Region:	STATE
Facility ID:	00000060740
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	GEORGE MAKIMOTO, INC.
Telephone:	9166526196
Owner Name:	UNION OIL CO.
Owner Address:	1 CALIFORNIA ST., SUITE 2700
Owner City,St,Zip:	SAN FRANCISCO, CA 94111
Total Tanks:	0001
Tank Num:	001
Container Num:	6008-10-1
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	6
Leak Detection:	Visual

Click here for Geo Tracker PDF:

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32 WSW 1/2-1 0.632 mi. 3338 ft. | **FOREST PRODUCTS MANUFACTURING, PARCEL 5** | **RESPONSE** | **S101481497**
ANTHONY COURT | **ENVIROSTOR** | **N/A**
ROCKLIN, CA 95677 | **HIST Cal-Sites**

Relative: Lower

Actual: 308 ft.

RESPONSE:

Facility ID:	31240008
Site Type:	State Response
Site Type Detail:	State Response or NPL

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Acres:	Not reported
National Priorities List:	NO
Cleanup Oversight Agencies:	NONE SPECIFIED
Lead Agency Description:	Not reported
Project Manager:	Not reported
Supervisor:	* Egarcia2
Division Branch:	Cleanup Sacramento
Site Code:	100171
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	06
Senate:	01
Special Program Status:	Not reported
Status:	Certified
Status Date:	10/15/1993
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.80343
Longitude:	-121.2165
APN:	NONE SPECIFIED
Past Use:	MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC :	* HALOGENATED SOLVENTS * OXYGENATED SOLVENTS * AQUEOUS SOLUTION WITH METALS * CONTAMINATED SOIL * Sludge - Paint * UNSPECIFIED ACID SOLUTION * UNSPECIFIED SLUDGE WASTE * LATEX WASTE * POLYMERIC RESIN WASTE Lead Mercury and compounds
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	BENDIX CORP (FOREST PRODUCTS DIVISION)
Alias Type:	Alternate Name
Alias Name:	EMKAY DEVELOPMENT
Alias Type:	Alternate Name
Alias Name:	FOREST PRODUCTS MANUFACTURING COMPANY
Alias Type:	Alternate Name
Alias Name:	H. INVESTMENT COMPANY
Alias Type:	Alternate Name
Alias Name:	CAD981383896
Alias Type:	EPA Identification Number
Alias Name:	110033615540
Alias Type:	EPA (FRS #)
Alias Name:	SLT5S1393179
Alias Type:	GeoTracker Global ID
Alias Name:	100071
Alias Type:	Project Code (Site Code)
Alias Name:	100171
Alias Type:	Project Code (Site Code)
Alias Name:	31240008
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	10/15/1993
Comments:	SMALL CERTIFICATION: Forest Products Manufacturing-Rocklin certification of Parcel #5 has been completed. On site soils contain trace amounts of bis(2-ethylhexyl)phthalate, however, the levels do not pose a health threat. On-site ground water sampling showed that the above chemical in no longer present in the ground water, but is present in low levels on an off-site well. The levels found in the

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

off-site well also do no pose a health threat. The certification of this site was based on these risk assessment conclusions.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 09/22/1981
Comments: FACILITY IDENTIFIED TIP FROM PLACER CO ENVR HLTH

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 09/18/1981
Comments: FACILITY IDENTIFIED C. OF C. DIRECTORY QUEST SENT

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 06/26/1992
Comments: A Preliminary Endangerment Assessment was completed in June 1992. This report was conditionally approved by DTSC provided recommendations were modified to reflect the need for further action. Bis (2-ethylhexyl) phthalate was detected in subsurface soils and in shallow ground water above MCLs.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Expedited Response Action
Completed Date: 12/20/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 06/23/1987
Comments: PRELIM ASSESS DONE HISTORICAL SAMPLE RESULTS & VISUAL OBSERVATIONS INDICATE SI IS NECESSARY

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/02/1987
Comments: SITE SCREENING DONE ABANDONED SITE ISSUE NOT RESOLVED

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 31240008
Status: Certified

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Status Date:	10/15/1993
Site Code:	100171
Site Type:	State Response
Site Type Detailed:	State Response or NPL
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	* Egarcia2
Division Branch:	Cleanup Sacramento
Assembly:	06
Senate:	01
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	38.80343
Longitude:	-121.2165
APN:	NONE SPECIFIED
Past Use:	MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC:	* HALOGENATED SOLVENTS * OXYGENATED SOLVENTS * AQUEOUS SOLUTION WITH METALS * CONTAMINATED SOIL * Sludge - Paint * UNSPECIFIED ACID SOLUTION * UNSPECIFIED SLUDGE WASTE * LATEX WASTE * POLYMERIC RESIN WASTE Lead Mercury and compounds
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	BENDIX CORP (FOREST PRODUCTS DIVISION)
Alias Type:	Alternate Name
Alias Name:	EMKAY DEVELOPMENT
Alias Type:	Alternate Name
Alias Name:	FOREST PRODUCTS MANUFACTURING COMPANY
Alias Type:	Alternate Name
Alias Name:	H. INVESTMENT COMPANY
Alias Type:	Alternate Name
Alias Name:	CAD981383896
Alias Type:	EPA Identification Number
Alias Name:	110033615540
Alias Type:	EPA (FRS #)
Alias Name:	SLT5S1393179
Alias Type:	GeoTracker Global ID
Alias Name:	100071
Alias Type:	Project Code (Site Code)
Alias Name:	100171
Alias Type:	Project Code (Site Code)
Alias Name:	31240008
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	10/15/1993
Comments:	SMALL CERTIFICATION: Forest Products Manufacturing-Rocklin certification of Parcel #5 has been completed. On site soils contain trace amounts of bis(2-ethylhexyl)phthalate, however, the levels do not pose a health threat. On-site ground water sampling showed that the above chemical in no longer present in the ground water, but is

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

present in low levels on an off-site well. The levels found in the off-site well also do no pose a health threat. The certification of this site was based on these risk assessment conclusions.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 09/22/1981
Comments: FACILITY IDENTIFIED TIP FROM PLACER CO ENVR HLTH

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 09/18/1981
Comments: FACILITY IDENTIFIED C. OF C. DIRECTORY QUEST SENT

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 06/26/1992
Comments: A Preliminary Endangerment Assessment was completed in June 1992. This report was conditionally approved by DTSC provided recommendations were modified to reflect the need for further action. Bis (2-ethylhexyl) phthalate was detected in subsurface soils and in shallow ground water above MCLs.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Expedited Response Action
Completed Date: 12/20/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 06/23/1987
Comments: PRELIM ASSESS DONE HISTORICAL SAMPLE RESULTS & VISUAL OBSERVATIONS INDICATE SI IS NECESSARY

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/02/1987
Comments: SITE SCREENING DONE ABANDONED SITE ISSUE NOT RESOLVED

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Calsite:
Region: SACRAMENTO

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Facility ID:	31240008
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	10151993
Status:	CERTIFIED AS HAVING BEEN REMEDIED SATISFACTORILY UNDER DTSC OVERSIGHT
Status Name:	CERTIFIED
Lead Agency:	N/A
NPL:	Not Listed
SIC Code:	24
SIC Name:	MANU - LUMBER & WOOD PRODUCTS
Access:	Uncontrolled
Cortese:	Not reported
Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Not reported
Staff Member Responsible for Site:	Not reported
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	CV
Region Water Control Board Name:	CENTRAL VALLEY
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	04
State Senate District Code:	04
Facility ID:	31240008
Activity:	DISC
Activity Name:	DISCOVERY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	09181981
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	31240008
Activity:	DISC
Activity Name:	DISCOVERY
AWP Code:	Not reported
Proposed Budget:	0

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	09221981
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	31240008
Activity:	SS
Activity Name:	SITE SCREENING
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02021987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	31240008
Activity:	ERA
Activity Name:	EXPEDITED RESPONSE ACTION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12201991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	60 DRUMS REMOVED.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	31240008
Activity:	PEA
Activity Name:	PRELIMINARY ENDANGERMENT ASSESSMENT
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06261992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	31240008
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	10151993
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Unknown Type:	0
Alternate Address:	ANTHONY COURT
Alternate City,St,Zip:	ROCKLIN, CA 95677
Alternate Address:	APN 045-010-63
Alternate City,St,Zip:	Not reported
Alternate Address:	4315 DOMINGUEZ ROAD
Alternate City,St,Zip:	ROCKLIN, CA 95677
Background Info:	Not reported
Comments Date:	02021987
Comments:	SITE SCREENING DONE ABANDONED SITE ISSUE NOT RESOLVED
Comments Date:	05011986
Comments:	This is the date the site was first listed AWP pursuant to H&S
Comments Date:	05011986
Comments:	Section 25356.
Comments Date:	05151991
Comments:	Not on 1990/1991 Bond Expenditure Plan. Status needs to be
Comments Date:	05151991
Comments:	determined.
Comments Date:	06191987
Comments:	Facility Drive-By identified discharge of potential hazardous
Comments Date:	06191987
Comments:	waste. Ground Photos. TSCD: Placer County Environmental Health
Comments Date:	06191987
Comments:	Placer County Planning; Placer County Assessor Office; Rocklin
Comments Date:	06191987
Comments:	City Planning.
Comments Date:	06231987
Comments:	PRELIM ASSESS DONE HISTORICAL SAMPLE RESULTS & VISUAL
Comments Date:	06231987
Comments:	OBSERVATIONS INDICATE SI IS NECESSARY
Comments Date:	06261992
Comments:	A Preliminary Endangerment Assessment was completed in June 1992.
Comments Date:	06261992
Comments:	This report was conditionally approved by DTSC provided
Comments Date:	06261992
Comments:	recommendations were modified to reflect the need for further
Comments Date:	06261992
Comments:	action. Bis (2-ethylhexyl) phthalate was detected in subsurface
Comments Date:	06261992
Comments:	soils and in shallow ground water above MCLs.
Comments Date:	07081987
Comments:	Dept of Fist and Game, Natural Diversity Database.
Comments Date:	07211992
Comments:	RWQCB: Notified of groundwater contamination
Comments Date:	08151989
Comments:	SITE IS ON 1989 BOND EXPENDITURE PLAN
Comments Date:	09181981
Comments:	FACILITY IDENTIFIED C. OF C. DIRECTORY
Comments Date:	09181981
Comments:	QUEST SENT
Comments Date:	09221981
Comments:	FACILITY IDENTIFIED TIP FROM PLACER CO ENVR HLTH
Comments Date:	10081981
Comments:	QUEST REC.
Comments Date:	10081981
Comments:	AGENCY RECORDS-RWQCB
Comments Date:	10091981

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Comments:	LETTER RESPONSE RECEIVED
Comments Date:	10131981
Comments:	PHONE F-U
Comments Date:	10151993
Comments:	SMALL CERTIFICATION: Forest Products Manufacturing-Rocklin
Comments Date:	10151993
Comments:	certification of Parcel #5 has been completed. On site soils
Comments Date:	10151993
Comments:	contain trace amounts of bis(2-ethylhexyl)phthalate, however,
Comments Date:	10151993
Comments:	the levels do not pose a health threat. On-site ground water
Comments Date:	10151993
Comments:	sampling showed that the above chemical in no longer present in
Comments Date:	10151993
Comments:	the ground water, but is present in low levels on an off-site
Comments Date:	10151993
Comments:	well. The levels found in the off-site well also do no pose a
Comments Date:	10151993
Comments:	health threat. The certification of this site was based on
Comments Date:	10151993
Comments:	these risk assessment conclusions.
Comments Date:	10211981
Comments:	LETTER SENT CONCERNING SITE INSP
Comments Date:	10271981
Comments:	PHONE F-U
Comments Date:	10271981
Comments:	RWQCB & CO ENVIR HLTH RECORDS SEARCHED
Comments Date:	10281981
Comments:	INSPECTION(STATE) DHS/ASP. EVAP.POND
Comments Date:	10291981
Comments:	RECORDS-SECRETARY OF STATE, RECORDS-CORP
Comments Date:	10291981
Comments:	DIV OF BENDIX CORP.
Comments Date:	11021981
Comments:	AERIAL SURVEILLANCE AERIAL PHOTOS ORDERED
Comments Date:	11031981
Comments:	INSPECTION(STATE) SAMPLED-SLUDGE & WELL
Comments Date:	11031981
Comments:	SAMPLE RESULTS SLUDGE WITH HIGH CONC OF HEAVY METALS
Comments Date:	11051991
Comments:	Buried drums discovered during test pit excavation for PEA.
Comments Date:	11051991
Comments:	Electromagnetometer survey conducted and revealed several
Comments Date:	11051991
Comments:	anomalies. Areas of anomolies excavated and approximately 60
Comments Date:	11051991
Comments:	buried drums removed. Drums were primarily empty, some contained
Comments Date:	11051991
Comments:	dried paints or resins. Drums disposed of in local landfill.
Comments Date:	11301981
Comments:	FINAL STRATEGY SITE REFERRED: TO HWMB/ENF
Comments Date:	12291994
Comments:	On 12/29/94 the name and address of this site were changed to
Comments Date:	12291994
Comments:	better reflect the location of the property that was investigated
Comments Date:	12291994
Comments:	by DTSC. The former site name was "Forest Products Manufacturing

FOREST PRODUCTS MANUFACTURING, PARCEL 5 (Continued) **S101481497**

Comments Date:	12291994
Comments:	Company," and the former address was 4315 Dominguez Road. DTSC's
Comments Date:	12291994
Comments:	oversight of this project focused on "Parcel 5" which was the
Comments Date:	12291994
Comments:	former location of paint ponds used by Forest Products on
Comments Date:	12291994
Comments:	Dominguez Road. DTSC did not investigate activities at the main
Comments Date:	12291994
Comments:	facility located on Dominguez Road.
ID Name:	EPA IDENTIFICATION NUMBER
ID Value:	CAD981383896
ID Name:	CALSTARS CODE
ID Value:	100071
Alternate Name:	FOREST PRODUCTS MANUFACTURING COMPANYBENDIX CORP (FOREST PRODUCTS DIVISION)FOREST PRODUCTS MANUFACTURING, PARCEL 5EMKAY DEVELOPMENTH. INVESTMENT COMPANY
Special Programs Code:	Not reported
Special Programs Name:	Not reported

33
SW
1/2-1
0.687 mi.
3628 ft.

ROCKLIN OPERATION **ENF** **S102005395**
300 DOMINGUEZ RD **WDS** **N/A**
ROCKLIN, CA 95677

Relative:
Lower

Actual:
299 ft.

ENF:

Region:	5S
Facility Id:	253150
Agency Name:	Sierra Pine Limited
Place Type:	Manufacturing
Place Subtype:	Manufacturing NEC
Facility Type:	Industrial
Agency Type:	Privately-Owned Business
# Of Agencies:	1
Place Latitude:	38.802
Place Longitude:	-121.21591
SIC Code 1:	2493
SIC Desc 1:	Reconstituted Wood Products
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	321219
NAICS Desc 1:	Reconstituted Wood Product Manufacturing
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	0.014
Threat To Water Quality:	2
Complexity:	B
Pretreatment:	N - POTW does not have EPA approved pretreatment prog.
Facility Waste Type:	Not reported
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported

ROCKLIN OPERATION (Continued) **S102005395**

Facility Waste Type 4:	Not reported
Program:	WDRINDIVSML
Program Category1:	WDR
Program Category2:	WDR
# Of Programs:	1
WDID:	5A312036001
Reg Measure Id:	146410
Reg Measure Type:	WDR
Region:	5S
Order #:	95-095
Npdes# CA#:	Not reported
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	Not reported
Status:	Active
Status Date:	04/16/2014
Effective Date:	04/28/1995
Expiration/Review Date:	04/28/2005
Termination Date:	Not reported
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	N
Individual/General:	I
Fee Code:	58 - Non15 Based on (TTWQ)/CPLX)
Direction/Voice:	Passive
Enforcement Id(EID):	383818
Region:	5S
Order / Resolution Number:	Not reported
Enforcement Action Type:	Oral Communication
Effective Date:	02/07/2012
Adoption/Issuance Date:	02/07/2012
Achieve Date:	Not reported
Termination Date:	02/07/2012
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Historical
Title:	Oral Com 02/07/2012 for Sierra Pine Limited
Description:	Not reported
Program:	WDR
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	$0.00
Initial Assessed Amount:	$0.00
Liability $ Amount:	$0.00
Project $ Amount:	$0.00
Liability $ Paid:	$0.00
Project $ Completed:	$0.00
Total $ Paid/Completed Amount:	$0.00

ROCKLIN OPERATION (Continued) **S102005395**

WDS:

Facility ID:	Sacramento River 312036001
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	Not reported
Subregion:	0
Facility Telephone:	Not reported
Facility Contact:	DENNIS MOORE
Agency Name:	SIERRA PINE LIMITED
Agency Address:	4300 DOMINGUEZ RD
Agency City,St,Zip:	ROCKLIN 95677
Agency Contact:	KATHERINE FRY
Agency Telephone:	9166303261
Agency Type:	Private
SIC Code:	2661
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The POTW Does not have an approved pretreatment program. Some POTWs may have local pretreatment programs that have not been approved by the regional board and/or EPA.
Treat To Water:	Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility.
Complexity:	Category B - Any facility having a physical, chemical, or biological waste treatment system (except for septic systems with subsurface disposal), or any Class II or III disposal site, or facilities without treatment systems that are complex, such as marinas with petroleum products, solid wastes, and sewage pump out facilities.

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34 **FOREST PRODUCTS MFG. CO** **CA BOND EXP. PLAN** **S100833489**
WSW **4315 DOMINGUEZ ROAD** **EMI** **N/A**
1/2-1 **ROCKLIN, CA 95677**
0.707 mi.
3735 ft.

Relative:
Lower

Actual:
304 ft.

CA BOND EXP. PLAN:

Reponsible Party:	BACKLOG SITE CLEANUP PLANNING REPORT
Project Revenue Source Company:	Not reported
Project Revenue Source Addr:	Not reported
Project Revenue Source City,St,Zip:	Not reported

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

Project Revenue Source Desc:	This site is projected to be remediated by the responsible parties with reimbursement to DHS for its oversight. If the RPs are unable to fund site investigation and cleanup, another source of funds will need to be identified.
Site Description:	A wood coating facility operated by Forest Products, Inc. was located at this site. Paint wastes were stored in drums and disposed of in an onsite pond. This site was identified as H. Investment Company in the last Expenditure Plan.
Hazardous Waste Desc:	The material in question was composed of paint film from dry evaporation ponds, paint solids in drums, and paint solids from around paving at the site. Mercury was identified as the primary hazardous component of the wastes.
Threat To Public Health & Env:	The primary concern is the possibility of ground water contamination, as the soils in the area are known to have a medium to high permeability. Ground water flow generally is south towards Sacker Ravine, which is located approximately 500 to 600 feetsouth of the ponds.
Site Activity Status:	Approximately 65 cubic yards of soil was removed and disposed of in an approved landfill in November, 1983. Additional soil was removed from the pond areas in November, 1985. In January, 1986, H. Investment contacted DHS to evaluate the cleanup measures taken.

EMI:

Year:	1990
County Code:	31
Air Basin:	SV
Facility ID:	60
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	3
Reactive Organic Gases Tons/Yr:	3
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	4
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1

Year:	1995
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	42
Reactive Organic Gases Tons/Yr:	41
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	4
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1

Year:	1996
County Code:	31
Air Basin:	SV
Facility ID:	70

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	42
Reactive Organic Gases Tons/Yr:	41
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	4
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1

Year:	1997
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	42
Reactive Organic Gases Tons/Yr:	41
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	4
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1

Year:	1998
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	42
Reactive Organic Gases Tons/Yr:	41
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	4
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1

Year:	1999
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	18

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

Reactive Organic Gases Tons/Yr:	18
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	24
Part. Matter 10 Micrometers and Smllr Tons/Yr:	10

Year:	2000
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	18
Reactive Organic Gases Tons/Yr:	18
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	24
Part. Matter 10 Micrometers and Smllr Tons/Yr:	10

Year:	2001
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	18
Reactive Organic Gases Tons/Yr:	18
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	24
Part. Matter 10 Micrometers and Smllr Tons/Yr:	10

Year:	2002
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	19
Reactive Organic Gases Tons/Yr:	19
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	8
Part. Matter 10 Micrometers and Smllr Tons/Yr:	8

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

Year:	2003
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	22
Reactive Organic Gases Tons/Yr:	21
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	5
Part. Matter 10 Micrometers and Smllr Tons/Yr:	2

Year:	2004
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	21.553
Reactive Organic Gases Tons/Yr:	20.818375
Carbon Monoxide Emissions Tons/Yr:	0.1302114
NOX - Oxides of Nitrogen Tons/Yr:	0.651057
SOX - Oxides of Sulphur Tons/Yr:	0.0039063
Particulate Matter Tons/Yr:	5.1715528
Part. Matter 10 Micrometers and Smllr Tons/Yr:	2.0885528

Year:	2005
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	25.113
Reactive Organic Gases Tons/Yr:	24.2168635
Carbon Monoxide Emissions Tons/Yr:	.2693
NOX - Oxides of Nitrogen Tons/Yr:	1.3465
SOX - Oxides of Sulphur Tons/Yr:	.008079
Particulate Matter Tons/Yr:	6.6706
Part. Matter 10 Micrometers and Smllr Tons/Yr:	2.708325

Year:	2006
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	18.23684449176098437
Reactive Organic Gases Tons/Yr:	17.5767675
Carbon Monoxide Emissions Tons/Yr:	.2233
NOX - Oxides of Nitrogen Tons/Yr:	1.1165
SOX - Oxides of Sulphur Tons/Yr:	.006699
Particulate Matter Tons/Yr:	5.979625
Part. Matter 10 Micrometers and Smllr Tons/Yr:	2.425345

Year:	2007
County Code:	31
Air Basin:	SV
Facility ID:	70
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	15.13683034067908750
Reactive Organic Gases Tons/Yr:	14.5789685
Carbon Monoxide Emissions Tons/Yr:	.2145
NOX - Oxides of Nitrogen Tons/Yr:	1.0725
SOX - Oxides of Sulphur Tons/Yr:	.006435
Particulate Matter Tons/Yr:	2.810625
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1.156425

Year:	2008
County Code:	31
Air Basin:	SV
Facility ID:	183
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	15.13683034067908750
Reactive Organic Gases Tons/Yr:	14.5789685
Carbon Monoxide Emissions Tons/Yr:	.2145
NOX - Oxides of Nitrogen Tons/Yr:	1.0725
SOX - Oxides of Sulphur Tons/Yr:	.006435
Particulate Matter Tons/Yr:	2.810625
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1.156425

Year:	2009
County Code:	31
Air Basin:	SV
Facility ID:	183
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	N
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	11.459
Reactive Organic Gases Tons/Yr:	10.749605000000001
Carbon Monoxide Emissions Tons/Yr:	0.89124000000000003

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

NOX - Oxides of Nitrogen Tons/Yr:	1.0609999999999999
SOX - Oxides of Sulphur Tons/Yr:	6.3660000000000001E-3
Particulate Matter Tons/Yr:	2.4480110000000002
Part. Matter 10 Micrometers and Smllr Tons/Yr:	2.448375

Year:	2010
County Code:	31
Air Basin:	SV
Facility ID:	183
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	N
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	5.6125917497964997
Reactive Organic Gases Tons/Yr:	5.2283549999999996
Carbon Monoxide Emissions Tons/Yr:	0.89124000000000003
NOX - Oxides of Nitrogen Tons/Yr:	1.0609999999999999
SOX - Oxides of Sulphur Tons/Yr:	6.3660000000000001E-3
Particulate Matter Tons/Yr:	3.1806359999999998
Part. Matter 10 Micrometers and Smllr Tons/Yr:	3.1806359999999998

Year:	2013
County Code:	31
Air Basin:	SV
Facility ID:	183
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	8.7071442201
Reactive Organic Gases Tons/Yr:	8.155
Carbon Monoxide Emissions Tons/Yr:	0.873
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0.006
Particulate Matter Tons/Yr:	2.236
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.94

Year:	2014
County Code:	31
Air Basin:	SV
Facility ID:	183
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	12.380430961
Reactive Organic Gases Tons/Yr:	11.6429
Carbon Monoxide Emissions Tons/Yr:	0.655
NOX - Oxides of Nitrogen Tons/Yr:	0.78
SOX - Oxides of Sulphur Tons/Yr:	0.004
Particulate Matter Tons/Yr:	1.699
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1.699

Year:	2015

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

County Code:	31
Air Basin:	SV
Facility ID:	183
Air District Name:	PLA
SIC Code:	2431
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	12.380430961
Reactive Organic Gases Tons/Yr:	11.6429
Carbon Monoxide Emissions Tons/Yr:	0.655
NOX - Oxides of Nitrogen Tons/Yr:	0.78
SOX - Oxides of Sulphur Tons/Yr:	0.004
Particulate Matter Tons/Yr:	1.699
Part. Matter 10 Micrometers and Smllr Tons/Yr:	1.699

35
NE
1/2-1
0.784 mi.
4142 ft.

LOOMIS MS4 PHASE II
6140 HORSESHOE BAR
LOOMIS, CA 95650

ENF **S106800632**
NPDES **N/A**
WDS

Relative:
Higher

Actual:
375 ft.

ENF:

Region:	5S
Facility Id:	237358
Agency Name:	Town of Loomis
Place Type:	Utility
Place Subtype:	MS4
Facility Type:	All other facilities
Agency Type:	City Agency
# Of Agencies:	1
Place Latitude:	38.817627
Place Longitude:	-121.189913
SIC Code 1:	9199
SIC Desc 1:	General Government, NEC
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	Not reported
Threat To Water Quality:	3
Complexity:	C
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Stormwater runoff
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	MNSTW2
Program Category1:	NPDESSW
Program Category2:	NPDESSW

LOOMIS MS4 PHASE II (Continued) **S106800632**

# Of Programs:	1
WDID:	5A31NP00022
Reg Measure Id:	194489
Reg Measure Type:	Enrollee
Region:	5S
Order #:	2003-0005-DWQ
Npdes# CA#:	CAS000004
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	1000
Status:	Historical
Status Date:	09/25/2013
Effective Date:	12/04/2004
Expiration/Review Date:	04/30/2008
Termination Date:	06/30/2013
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported
Status Enrollee:	Y
Individual/General:	I
Fee Code:	52 - Area Wide Municipal Storm Water Permit
Direction/Voice:	Passive
Enforcement Id(EID):	388277
Region:	5S
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice to Comply
Effective Date:	11/30/2012
Adoption/Issuance Date:	11/30/2012
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	NONC 11/30/2012 for City of Loomis
Description:	The Regional Board (RB) office issued a Notice of Violation for failure to submit 2010-11 & 2011-12 Annual Reports. Discharger is required to submit reports no later than 31 December 2012.
Program:	MNSTW2
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	$0.00
Initial Assessed Amount:	$0.00
Liability $ Amount:	$0.00
Project $ Amount:	$0.00
Liability $ Paid:	$0.00
Project $ Completed:	$0.00
Total $ Paid/Completed Amount:	$0.00
Region:	5S
Facility Id:	237358

LOOMIS MS4 PHASE II (Continued) **S106800632**

Agency Name:	Town of Loomis
Place Type:	Utility
Place Subtype:	MS4
Facility Type:	All other facilities
Agency Type:	City Agency
# Of Agencies:	1
Place Latitude:	38.817627
Place Longitude:	-121.189913
SIC Code 1:	9199
SIC Desc 1:	General Government, NEC
SIC Code 2:	Not reported
SIC Desc 2:	Not reported
SIC Code 3:	Not reported
SIC Desc 3:	Not reported
NAICS Code 1:	Not reported
NAICS Desc 1:	Not reported
NAICS Code 2:	Not reported
NAICS Desc 2:	Not reported
NAICS Code 3:	Not reported
NAICS Desc 3:	Not reported
# Of Places:	1
Source Of Facility:	Reg Meas
Design Flow:	Not reported
Threat To Water Quality:	3
Complexity:	C
Pretreatment:	X - Facility is not a POTW
Facility Waste Type:	Stormwater runoff
Facility Waste Type 2:	Not reported
Facility Waste Type 3:	Not reported
Facility Waste Type 4:	Not reported
Program:	MNSTW2
Program Category1:	NPDESSW
Program Category2:	NPDESSW
# Of Programs:	1
WDID:	5A31NP00022
Reg Measure Id:	194489
Reg Measure Type:	Enrollee
Region:	5S
Order #:	2003-0005-DWQ
Npdes# CA#:	CAS000004
Major-Minor:	Not reported
Npdes Type:	Not reported
Reclamation:	N - No
Dredge Fill Fee:	Not reported
301H:	Not reported
Application Fee Amt Received:	1000
Status:	Historical
Status Date:	09/25/2013
Effective Date:	12/04/2004
Expiration/Review Date:	04/30/2008
Termination Date:	06/30/2013
WDR Review - Amend:	Not reported
WDR Review - Revise/Renew:	Not reported
WDR Review - Rescind:	Not reported
WDR Review - No Action Required:	Not reported
WDR Review - Pending:	Not reported
WDR Review - Planned:	Not reported

LOOMIS MS4 PHASE II (Continued) **S106800632**

Status Enrollee:	Y
Individual/General:	I
Fee Code:	52 - Area Wide Municipal Storm Water Permit
Direction/Voice:	Passive
Enforcement Id(EID):	365851
Region:	5S
Order / Resolution Number:	Not reported
Enforcement Action Type:	Notice of Violation
Effective Date:	11/03/2008
Adoption/Issuance Date:	Not reported
Achieve Date:	Not reported
Termination Date:	Not reported
ACL Issuance Date:	Not reported
EPL Issuance Date:	Not reported
Status:	Active
Title:	NOV 11/03/2008 for Town of Loomis
Description:	Late Annual Report.
Program:	MNSTW2
Latest Milestone Completion Date:	Not reported
# Of Programs1:	1
Total Assessment Amount:	$0.00
Initial Assessed Amount:	$0.00
Liability $ Amount:	$0.00
Project $ Amount:	$0.00
Liability $ Paid:	$0.00
Project $ Completed:	$0.00
Total $ Paid/Completed Amount:	$0.00

NPDES:

Npdes Number:	CAS000004
Facility Status:	Historical
Agency Id:	26164
Region:	5S
Regulatory Measure Id:	194489
Order No:	2003-0005-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	237358
WDID:	5A31NP00022
Program Type:	MNSTW2
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	12/04/2004
Expiration Date Of Regulatory Measure:	04/30/2008
Termination Date Of Regulatory Measure:	06/30/2013
Discharge Name:	Town of Loomis
Discharge Address:	6140 Horseshoe Bar Road
Discharge City:	Loomis
Discharge State:	CA
Discharge Zip:	95650
RECEIVED DATE:	Not reported
PROCESSED DATE:	Not reported
STATUS CODE NAME:	Not reported
STATUS DATE:	Not reported
PLACE SIZE:	Not reported
PLACE SIZE UNIT:	Not reported
FACILITY CONTACT NAME:	Not reported
FACILITY CONTACT TITLE:	Not reported
FACILITY CONTACT PHONE:	Not reported

LOOMIS MS4 PHASE II (Continued) **S106800632**

FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	Not reported
OPERATOR NAME:	Not reported
OPERATOR ADDRESS:	Not reported
OPERATOR CITY:	Not reported
OPERATOR STATE:	Not reported
OPERATOR ZIP:	Not reported
OPERATOR CONTACT NAME:	Not reported
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	Not reported
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	Not reported
OPERATOR TYPE:	Not reported
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	Not reported
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Not reported
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	Not reported
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported

WDS:

Facility ID:	Sacramento River 31NP00022
Facility Type:	Other - Does not fall into the category of Municipal/Domestic, Industrial, Agricultural or Solid Waste (Class I, II or III)
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000004 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion:	0

LOOMIS MS4 PHASE II (Continued) **S106800632**

Facility Telephone:	9166521840
Facility Contact:	BRIAN FRAGIAO
Agency Name:	LOOMIS TOWN OF
Agency Address:	6140 HORSESHOE BAR RAOD
Agency City,St,Zip:	LOOMIS 95650
Agency Contact:	BRIAN FRAGIAO
Agency Telephone:	9166521840
Agency Type:	City
SIC Code:	9199
SIC Code 2:	Not reported
Primary Waste Type:	Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste).
Primary Waste:	STORMS
Waste Type2:	Not reported
Waste2:	Stormwater Runoff
Primary Waste Type:	Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste).
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The facility is not a POTW.
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

36
WSW
1/2-1
0.833 mi.
4397 ft.

LOUISIANA-PACIFIC CORP - ROCKLIN
4300 DOMINGUEZ ROAD
ROCKLIN, CA 95677

ENVIROSTOR **S104163540**
LUST **N/A**
HIST CORTESE
CA PLACER CO. MS
NPDES

Relative:
Lower

Actual:
303 ft.

ENVIROSTOR:

Facility ID:	31240011
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	1
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED

LOUISIANA-PACIFIC CORP - ROCKLIN (Continued) **S104163540**

Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	06
Senate:	01
Special Program:	* CERC2
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.80141
Longitude:	-121.2185
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	* HYDROCARBON SOLVENTS * BIOLOGICAL WASTE OTHER THAN SEWAGE SLUDGE * UNSPECIFIED ORGANIC LIQUID MIXTURE * PAPER SLUDGE/PULP
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	FIBREBOARD CORP (FC)
Alias Type:	Alternate Name
Alias Name:	Rocklin Mill/Sierra Pine Ltd
Alias Type:	Alternate Name
Alias Name:	Sierra Pine Limited
Alias Type:	Alternate Name
Alias Name:	110000485779
Alias Type:	EPA (FRS #)
Alias Name:	SLT5S2603298
Alias Type:	GeoTracker Global ID
Alias Name:	T0606100007
Alias Type:	GeoTracker Global ID
Alias Name:	31240011
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Discovery
Completed Date:	09/18/1981
Comments:	FACILITY IDENTIFIED CHAMBER OF COMMERCE DIRECTORY QUESTIONNAIRE SENT.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	03/26/1993
Comments:	Preliminary Endangerment Assessment required low priority. The manufacturing of fiberboard at the facility has led to elevated level of tannins and lignins in the area ground water up to 4.2 milligrams per liter (mg/L) and in the area surface water up to .9 mg/L. These contaminants are considered non-hazardous. The RWQCB has inspected the ponds on-site. Placer County is involved in the ground water and surface water monitoring. The Air Resources Board and local air pollution control district are monitoring formaldehyde releases into the air from the facility.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Assessment Report
Completed Date:	09/15/1989

LOUISIANA-PACIFIC CORP - ROCKLIN (Continued) **S104163540**

Comments: PRELIMINARY ASSSESSMENT (PA) DONE. MEDIUM PRIORITY SITE INSPECTION (SI) RECOMMENDED FOR DEPARTMENT OF HEALTH SERVICES (DHS) AND ENVIRONMENTAL PROTECTION AGENCY (EPA).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/03/1987
Comments: SITE SCREENING DONE. FILE INCOMPLETE, NO CLEANUP DOCUMENTED.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

LUST:
Region: STATE
Global Id: T0606100007
Latitude: 38.8004684
Longitude: -121.2140626
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 09/12/2001
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker: PRS
Local Agency: PLACER COUNTY
RB Case Number: 310009
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606100007
Contact Type: Regional Board Caseworker
Contact Name: PAUL SANDERS
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: psanders@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606100007
Contact Type: Local Agency Caseworker
Contact Name: WEST BOURGAULT
Organization Name: PLACER COUNTY
Address: 3091 County Center Drive, Suite 180
City: AUBURN
Email: wbourgau@placer.ca.gov

LOUISIANA-PACIFIC CORP - ROCKLIN (Continued) **S104163540**

Phone Number: Not reported

Status History:

Global Id: T0606100007
Status: Completed - Case Closed
Status Date: 09/12/2001

Global Id: T0606100007
Status: Open - Case Begin Date
Status Date: 11/04/1986

Global Id: T0606100007
Status: Open - Site Assessment
Status Date: 07/20/2001

Regulatory Activities:

Global Id: T0606100007
Action Type: ENFORCEMENT
Date: 01/18/2000
Action: Staff Letter

Global Id: T0606100007
Action Type: ENFORCEMENT
Date: 04/18/2001
Action: Staff Letter

Global Id: T0606100007
Action Type: ENFORCEMENT
Date: 08/22/2000
Action: Staff Letter

Global Id: T0606100007
Action Type: ENFORCEMENT
Date: 09/12/2001
Action: Closure/No Further Action Letter

Global Id: T0606100007
Action Type: Other
Date: 11/04/1986
Action: Leak Reported

HIST CORTESE:

Region: CORTESE
Facility County Code: 31
Reg By: LTNKA
Reg Id: 310009

PLACER CO. MS:

Facility ID: FA0001943
Facility Status: Closed
Program Element Code: 2105
Program: HAZMAT BUSINESS PLAN
Record Num: PR0002724
District Code: 18

LOUISIANA-PACIFIC CORP - ROCKLIN (Continued) **S104163540**

Decode for Fstatus:	Closed

Facility ID:	FA0001943
Facility Status:	Closed
Program Element Code:	2270
Program:	SMALL QUANTITY GENERATOR
Record Num:	PR0006803
District Code:	18
Decode for Fstatus:	Closed

NPDES:

Npdes Number:	CAS000001
Facility Status:	Terminated
Agency Id:	0
Region:	5S
Regulatory Measure Id:	199170
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S31I000782
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	03/20/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	06/30/2015
Discharge Name:	Sierrapine Rocklin Division
Discharge Address:	4300 DOMINGUEZ RD
Discharge City:	ROCKLIN
Discharge State:	California
Discharge Zip:	95677
RECEIVED DATE:	Not reported
PROCESSED DATE:	Not reported
STATUS CODE NAME:	Not reported
STATUS DATE:	Not reported
PLACE SIZE:	Not reported
PLACE SIZE UNIT:	Not reported
FACILITY CONTACT NAME:	Not reported
FACILITY CONTACT TITLE:	Not reported
FACILITY CONTACT PHONE:	Not reported
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	Not reported
OPERATOR NAME:	Not reported
OPERATOR ADDRESS:	Not reported
OPERATOR CITY:	Not reported
OPERATOR STATE:	Not reported
OPERATOR ZIP:	Not reported
OPERATOR CONTACT NAME:	Not reported
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	Not reported
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	Not reported
OPERATOR TYPE:	Not reported
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	Not reported
DEVELOPER ZIP:	Not reported

LOUISIANA-PACIFIC CORP - ROCKLIN (Continued) **S104163540**

DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	Not reported
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Not reported
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	Not reported
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported
Npdes Number:	Not reported
Facility Status:	Not reported
Agency Id:	Not reported
Region:	5S
Regulatory Measure Id:	199170
Order No:	Not reported
Regulatory Measure Type:	Industrial
Place Id:	Not reported
WDID:	5S31I000782
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
RECEIVED DATE:	5/9/2008
PROCESSED DATE:	3/20/1992
STATUS CODE NAME:	Active
STATUS DATE:	3/20/1992
PLACE SIZE:	36
PLACE SIZE UNIT:	52
FACILITY CONTACT NAME:	Katherine Fry
FACILITY CONTACT TITLE:	Not reported

LOUISIANA-PACIFIC CORP - ROCKLIN (Continued) **S104163540**

FACILITY CONTACT PHONE:	Not reported
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	kfry@sierrapine.com
OPERATOR NAME:	Sierrapine Rocklin Division
OPERATOR ADDRESS:	4300 DOMINGUEZ RD
OPERATOR CITY:	ROCKLIN
OPERATOR STATE:	California
OPERATOR ZIP:	95677
OPERATOR CONTACT NAME:	Lanny Hammock
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	916-624-2473
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	lhammock@sierrapine.com
OPERATOR TYPE:	Private Business
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	California
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported
CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	916-624-2473
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Sucker Ravine
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	2493-Reconstituted Wood Products
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported

37 WSW 1/2-1 0.899 mi. 4746 ft. | **LEGACY PLUMBING 4335 PACIFIC ST ROCKLIN, CA 95677** | **ENVIROSTOR EMI** | **S110502646 N/A**

Relative: Lower

Actual: 302 ft.

ENVIROSTOR:

Facility ID:	31240007
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	1
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	06
Senate:	01
Special Program:	* CERC2
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.80279
Longitude:	-121.2200
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	* Sludge - Paint * UNSPECIFIED SLUDGE WASTE
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	CAD982358517
Alias Type:	CERCLIS ID
Alias Name:	SLT5S1393179
Alias Type:	GeoTracker Global ID
Alias Name:	31240007
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Discovery
Completed Date:	09/18/1981
Comments:	FACILITY IDENTIFIED C. OF C. DIRECTORY. QUESTIONNAIRE SENT.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Assessment Report
Completed Date:	09/14/1989
Comments:	PRELIMINARY ASSESSMENT DONE. PAINT RESIDUE SPILLED ONSITE; COMPANY COMPLETED CLEANUP WITHOUT OVERSITE; NO FURTHER ACTION FOR ENVIRONMENTAL PROTECTION AGENCY; LOW PRIORITY SITE INSPECTION FOR DEPARMENT OF HEALTH SERVICES.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	01/30/1987

LEGACY PLUMBING (Continued) **S110502646**

Comments: SITE SCREENING DONE. ABANDONED SITE PROGRAM FILE STATED NO FURTHER ACTION NECESSARY, HOWEVER, NO CLEANUP WAS DOCUMENTED AND THE PROBLEM HAS NOT BEEN DEFINED.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

EMI:

Year: 2008
County Code: 31
Air Basin: SV
Facility ID: 970
Air District Name: PLA
SIC Code: 1711
Air District Name: PLACER COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: .0135655
Reactive Organic Gases Tons/Yr: .01351530765
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Year: 2009
County Code: 31
Air Basin: SV
Facility ID: 970
Air District Name: PLA
SIC Code: 1711
Air District Name: PLACER COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 1.8415000000000001E-2
Reactive Organic Gases Tons/Yr: 1.7999999999999999E-2
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Year: 2010
County Code: 31
Air Basin: SV
Facility ID: 970
Air District Name: PLA
SIC Code: 1711
Air District Name: PLACER COUNTY APCD
Community Health Air Pollution Info System: Not reported

LEGACY PLUMBING (Continued) **S110502646**

Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1.8415000000000001E-2
Reactive Organic Gases Tons/Yr:	1.8346864500000001E-2
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2011
County Code:	31
Air Basin:	SV
Facility ID:	970
Air District Name:	PLA
SIC Code:	1711
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.018415
Reactive Organic Gases Tons/Yr:	0.0183468645
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2012
County Code:	31
Air Basin:	SV
Facility ID:	970
Air District Name:	PLA
SIC Code:	1711
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.018415
Reactive Organic Gases Tons/Yr:	0.0183468645
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2013
County Code:	31
Air Basin:	SV
Facility ID:	970
Air District Name:	PLA
SIC Code:	1711
Air District Name:	PLACER COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.018415
Reactive Organic Gases Tons/Yr:	0.018415
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0

LEGACY PLUMBING (Continued) **S110502646**

Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr:0

Count: 5 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
LOOMIS	S117710738	SIERRA COLLEGE BLVD WIDENING GRANI	SIERRA COLLEGE BLVD.	95650	NPDES
LOOMIS	S106842899	LINCOLN HIGHWAY ABANDONMENT PARCEL	TAYLOR RD & UNION PACIFIC RR T		SLIC
ROCKLIN	S118597024	INTERSTATE 80 AT SIERRA COLLEGE BL	INTERSTATE 80 AT SIERRA COLLEG	95677	NPDES
ROCKLIN	S106230349	FOREST PRODUCTS MANUFACTURING ?	PACIFIC ST, INDUSTRIAL PARK, L		SLIC
ROCKLIN	S117710737	SIERRA COLLEGE BLVD WIDENING FROM	SIERRA COLLEGE BLVD AT ROCKLIN	95677	NPDES

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: N/A
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/07/2016	Source: EPA
Date Data Arrived at EDR: 04/05/2016	Telephone: N/A
Date Made Active in Reports: 04/15/2016	Last EDR Contact: 07/07/2016
Number of Days to Update: 10	Next Scheduled EDR Contact: 10/17/2016
	Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/13/2015	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/06/2016	Telephone: 703-603-8704
Date Made Active in Reports: 05/20/2016	Last EDR Contact: 07/06/2016
Number of Days to Update: 135	Next Scheduled EDR Contact: 10/17/2016
	Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/07/2016	Source: EPA
Date Data Arrived at EDR: 04/05/2016	Telephone: 800-424-9346
Date Made Active in Reports: 04/15/2016	Last EDR Contact: 07/22/2016
Number of Days to Update: 10	Next Scheduled EDR Contact: 10/31/2016
	Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/05/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/22/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/27/2016
Date Data Arrived at EDR: 06/30/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 64

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/21/2016
Date Data Arrived at EDR: 06/30/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/21/2016
Date Data Arrived at EDR: 06/30/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/21/2016
Date Data Arrived at EDR: 06/30/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/21/2016
Date Data Arrived at EDR: 06/30/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2015
Date Data Arrived at EDR: 05/29/2015
Date Made Active in Reports: 06/11/2015
Number of Days to Update: 13

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 08/12/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 05/09/2016
Date Data Arrived at EDR: 06/01/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 93

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/31/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 05/09/2016
Date Data Arrived at EDR: 06/01/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 93

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/31/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/28/2016
Date Data Arrived at EDR: 03/30/2016
Date Made Active in Reports: 05/20/2016
Number of Days to Update: 51

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 06/28/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 05/02/2016
Date Data Arrived at EDR: 05/04/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/02/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 05/02/2016
Date Data Arrived at EDR: 05/04/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/02/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/16/2016
Date Data Arrived at EDR: 05/18/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 34

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/16/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 12/11/2015
Date Data Arrived at EDR: 02/19/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 105

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/09/2015
Date Data Arrived at EDR: 02/12/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 112

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015
Date Data Arrived at EDR: 10/23/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 118
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 02/25/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/27/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/17/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/05/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 35
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/26/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Semi-Annually

SLIC: Statewide SLIC Cases
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/08/2016
Number of Days to Update: 55

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 01/07/2016
Date Data Arrived at EDR: 01/08/2016
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 41

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/25/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 37

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 01/26/2016
Date Data Arrived at EDR: 02/05/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 119

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/29/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 67

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/05/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 35

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/26/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/05/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 52

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 12/03/2015
Date Data Arrived at EDR: 02/04/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 120

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Semi-Annually

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 07/01/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 05/02/2016
Date Data Arrived at EDR: 05/04/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/02/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Quarterly

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 02/29/2016
Date Data Arrived at EDR: 03/07/2016
Date Made Active in Reports: 05/04/2016
Number of Days to Update: 58

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 06/15/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/21/2016
Date Data Arrived at EDR: 06/22/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 06/16/2016
Date Data Arrived at EDR: 06/16/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 54

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/10/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 08/05/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/20/2016
Next Scheduled EDR Contact: 10/07/2016
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 05/04/2016
Date Data Arrived at EDR: 06/03/2016
Date Made Active in Reports: 07/13/2016
Number of Days to Update: 40

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/31/2016
Next Scheduled EDR Contact: 06/13/2016
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 05/02/2016
Date Data Arrived at EDR: 05/04/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/02/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 05/10/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 08/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/04/2016
Date Data Arrived at EDR: 06/03/2016
Date Made Active in Reports: 07/13/2016
Number of Days to Update: 40

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/31/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 06/07/2016
Date Data Arrived at EDR: 06/09/2016
Date Made Active in Reports: 06/23/2016
Number of Days to Update: 14

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 08/24/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/07/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 43

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 07/29/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/06/2016
Date Data Arrived at EDR: 06/07/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 43

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/07/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2015
Date Data Arrived at EDR: 06/26/2015
Date Made Active in Reports: 09/02/2015
Number of Days to Update: 68

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 06/28/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 04/11/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 51

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/26/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing
The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing
The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/21/2016
Date Data Arrived at EDR: 06/30/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Varies

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 06/10/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/15/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 05/08/2016
Date Data Arrived at EDR: 05/18/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 107

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 08/08/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 09/06/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/24/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 133

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/26/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/25/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/07/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/01/2016
Date Data Arrived at EDR: 05/26/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 99

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/25/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 08/12/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 01/20/2016
Date Data Arrived at EDR: 04/28/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 127

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 03/18/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 28

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/05/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 06/09/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/06/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 07/29/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2015
Date Data Arrived at EDR: 07/09/2015
Date Made Active in Reports: 09/16/2015
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 08/02/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 04/06/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 149

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 09/30/2015
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 08/26/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/11/2016
Date Data Arrived at EDR: 03/15/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 80

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/26/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/23/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 03/07/2016
Date Data Arrived at EDR: 04/07/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 148

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/08/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/20/2015
Date Data Arrived at EDR: 10/27/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/09/2016
Date Data Arrived at EDR: 03/02/2016
Date Made Active in Reports: 04/15/2016
Number of Days to Update: 44

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 09/01/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/20/2015
Date Data Arrived at EDR: 09/09/2015
Date Made Active in Reports: 11/03/2015
Number of Days to Update: 55

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/07/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/03/2016
Date Made Active in Reports: 09/02/2016
Number of Days to Update: 91

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/24/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2015
Date Data Arrived at EDR: 01/29/2016
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 67

Source: Department of Defense
Telephone: 571-373-0407
Last EDR Contact: 06/20/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Varies

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/27/2016
Date Data Arrived at EDR: 06/28/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 51

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 06/28/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 37

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Annually

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 06/22/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 48

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 05/27/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 54

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/22/2016
Next Scheduled EDR Contact: 10/07/2016
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 04/25/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 53

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/20/2016
Next Scheduled EDR Contact: 10/07/2016
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 06/01/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 49

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/10/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 10/14/2015
Date Made Active in Reports: 12/11/2015
Number of Days to Update: 58

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Annually

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/23/2016
Date Data Arrived at EDR: 05/25/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 56

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/23/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/11/2016
Date Data Arrived at EDR: 07/13/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 36

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 07/13/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 06/07/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 43

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/07/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 05/16/2016
Date Data Arrived at EDR: 05/18/2016
Date Made Active in Reports: 06/23/2016
Number of Days to Update: 36

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/16/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 06/06/2016
Date Data Arrived at EDR: 06/07/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 43

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/07/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 06/13/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 56

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/14/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/10/2015
Date Data Arrived at EDR: 01/05/2016
Date Made Active in Reports: 02/12/2016
Number of Days to Update: 38

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 02/12/2016
Date Data Arrived at EDR: 03/16/2016
Date Made Active in Reports: 06/13/2016
Number of Days to Update: 89

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/16/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 07/15/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/24/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Varies

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 05/23/2016
Date Data Arrived at EDR: 05/25/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 56

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/23/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/20/2015
Date Data Arrived at EDR: 09/23/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 103

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 06/22/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 05/24/2016
Date Data Arrived at EDR: 05/25/2016
Date Made Active in Reports: 07/13/2016
Number of Days to Update: 49

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/23/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 07/07/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 37

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 07/07/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 08/08/2016
Number of Days to Update: 27

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List
Cupa Facility List

Date of Government Version: 06/06/2016
Date Data Arrived at EDR: 06/09/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 12

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/03/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 18

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 04/29/2016
Date Data Arrived at EDR: 05/03/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 45

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/27/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 05/26/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 22

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 09/06/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/24/2016
Date Data Arrived at EDR: 05/26/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 55

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 08/01/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 04/08/2016
Date Data Arrived at EDR: 05/03/2016
Date Made Active in Reports: 06/22/2016
Number of Days to Update: 50

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 05/24/2016
Date Data Arrived at EDR: 05/26/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 75

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/13/2016
Date Data Arrived at EDR: 07/19/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 21

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 07/13/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/08/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 41

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/22/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 04/26/2016
Date Data Arrived at EDR: 04/28/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 50

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/20/2016
Next Scheduled EDR Contact: 10/07/2016
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 05/16/2016
Date Data Arrived at EDR: 05/20/2016
Date Made Active in Reports: 08/08/2016
Number of Days to Update: 80

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 05/27/2016
Date Made Active in Reports: 06/22/2016
Number of Days to Update: 26

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 04/26/2016
Date Data Arrived at EDR: 04/27/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 51

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 08/19/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 06/15/2016
Next Scheduled EDR Contact: 07/04/2016
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/05/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 37

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/18/2016
Date Data Arrived at EDR: 04/20/2016
Date Made Active in Reports: 06/01/2016
Number of Days to Update: 42

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/19/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2016
Date Data Arrived at EDR: 01/26/2016
Date Made Active in Reports: 03/22/2016
Number of Days to Update: 56

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/18/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 03/29/2016
Date Data Arrived at EDR: 04/06/2016
Date Made Active in Reports: 06/13/2016
Number of Days to Update: 68

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/13/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/02/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 11

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/13/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 11/04/2015
Date Data Arrived at EDR: 11/13/2015
Date Made Active in Reports: 12/17/2015
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/25/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 06/23/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 28

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/03/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 67

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 04/07/2016
Date Data Arrived at EDR: 04/26/2016
Date Made Active in Reports: 06/01/2016
Number of Days to Update: 36

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 06/15/2016
Date Data Arrived at EDR: 06/20/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 59

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List

CUPA Facility List

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 06/01/2016
Date Made Active in Reports: 06/22/2016
Number of Days to Update: 21

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/24/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing

CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/24/2016
Date Data Arrived at EDR: 06/27/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 43

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 08/22/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/24/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/24/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 04/18/2016
Date Data Arrived at EDR: 05/06/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 42

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2016
Date Data Arrived at EDR: 05/17/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 35

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/08/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2016
Date Data Arrived at EDR: 05/17/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 35

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/08/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 05/01/2016
Date Data Arrived at EDR: 05/11/2016
Date Made Active in Reports: 06/01/2016
Number of Days to Update: 21

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/09/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/16/2016
Date Data Arrived at EDR: 06/20/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 50

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/13/2016
Date Data Arrived at EDR: 04/15/2016
Date Made Active in Reports: 05/09/2016
Number of Days to Update: 24

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/20/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/13/2016
Date Data Arrived at EDR: 07/18/2016
Date Made Active in Reports: 08/08/2016
Number of Days to Update: 21

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/20/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/02/2016
Date Data Arrived at EDR: 07/06/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 43

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/06/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/02/2016
Date Data Arrived at EDR: 07/06/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 43

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/05/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 06/09/2016
Date Data Arrived at EDR: 06/10/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 40

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 08/08/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 06/02/2016
Next Scheduled EDR Contact: 09/19/2016
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/20/2016
Next Scheduled EDR Contact: 10/07/2016
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/16/2016
Date Data Arrived at EDR: 06/20/2016
Date Made Active in Reports: 08/08/2016
Number of Days to Update: 49

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/15/2016
Next Scheduled EDR Contact: 10/03/2016
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 05/23/2016
Date Data Arrived at EDR: 05/24/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 28

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/07/2016
Date Made Active in Reports: 06/22/2016
Number of Days to Update: 15

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 05/27/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 06/09/2016
Date Data Arrived at EDR: 06/13/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 57

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/08/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 05/25/2016
Date Data Arrived at EDR: 05/26/2016
Date Made Active in Reports: 06/22/2016
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 08/24/2016
Next Scheduled EDR Contact: 12/12/2016
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/26/2016
Date Data Arrived at EDR: 06/01/2016
Date Made Active in Reports: 07/20/2016
Number of Days to Update: 49

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 11/21/2016
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List

CUPA facility listing.

Date of Government Version: 05/31/2016
Date Data Arrived at EDR: 06/02/2016
Date Made Active in Reports: 06/21/2016
Number of Days to Update: 19

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/17/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 06/14/2016
Date Data Arrived at EDR: 06/16/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 54

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/22/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/09/2016
Date Data Arrived at EDR: 06/13/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 57

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/08/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 06/09/2016
Date Data Arrived at EDR: 06/14/2016
Date Made Active in Reports: 08/08/2016
Number of Days to Update: 55

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/08/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 07/10/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 28

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 07/07/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/01/2016
Date Data Arrived at EDR: 07/05/2016
Date Made Active in Reports: 08/18/2016
Number of Days to Update: 44

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 06/24/2016
Next Scheduled EDR Contact: 10/10/2016
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/02/2016
Date Data Arrived at EDR: 06/07/2016
Date Made Active in Reports: 06/23/2016
Number of Days to Update: 16

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 09/02/2016
Next Scheduled EDR Contact: 12/19/2016
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 05/03/2016
Date Data Arrived at EDR: 05/10/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 38

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 10/07/2016
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 03/28/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 49

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/25/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/28/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/10/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 03/28/2016
Date Data Arrived at EDR: 04/29/2016
Date Made Active in Reports: 06/22/2016
Number of Days to Update: 54

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/25/2016
Next Scheduled EDR Contact: 11/07/2016
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 05/26/2016
Date Data Arrived at EDR: 06/16/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 54

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/16/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 06/30/2016
Date Data Arrived at EDR: 07/05/2016
Date Made Active in Reports: 08/09/2016
Number of Days to Update: 35

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/30/2016
Next Scheduled EDR Contact: 10/17/2016
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 04/29/2016
Date Data Arrived at EDR: 05/03/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 45

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/27/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 08/10/2016
Next Scheduled EDR Contact: 11/28/2016
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/17/2015
Date Made Active in Reports: 08/12/2015
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/11/2016
Next Scheduled EDR Contact: 10/24/2016
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/01/2016
Date Data Arrived at EDR: 05/06/2016
Date Made Active in Reports: 06/17/2016
Number of Days to Update: 42

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 08/03/2016
Next Scheduled EDR Contact: 11/14/2016
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/24/2015
Date Made Active in Reports: 08/18/2015
Number of Days to Update: 25

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/18/2016
Next Scheduled EDR Contact: 10/31/2016
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 08/22/2016
Next Scheduled EDR Contact: 12/05/2016
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 04/14/2016
Date Made Active in Reports: 06/03/2016
Number of Days to Update: 50

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/13/2016
Next Scheduled EDR Contact: 09/26/2016
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

SEC BRACE RD AND SIERRA COLLEGE BLVD
SEC BRACE RD AND SIERRA COLLEGE BLVD
LOOMIS, CA 95650

TARGET PROPERTY COORDINATES

Latitude (North):	38.809213 - 38˚ 48' 33.17''
Longitude (West):	121.203369 - 121˚ 12' 12.13''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	655999.9
UTM Y (Meters):	4296930.5
Elevation:	336 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5629068 ROCKLIN, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

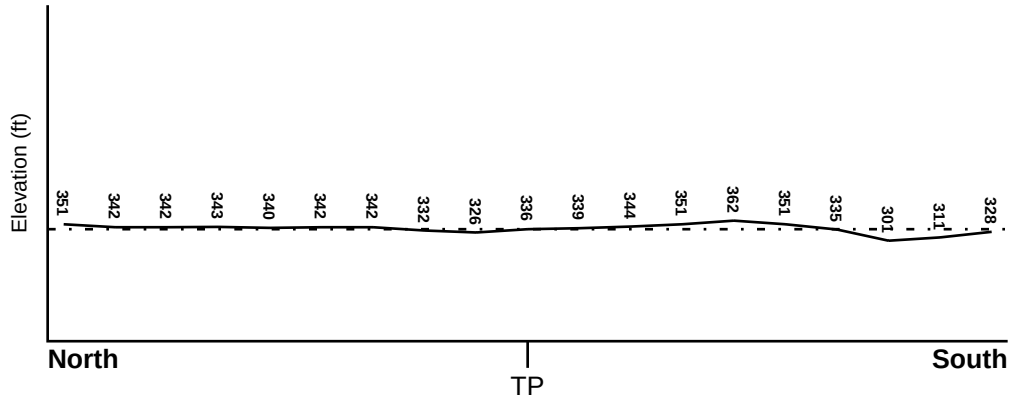
TOPOGRAPHIC INFORMATION

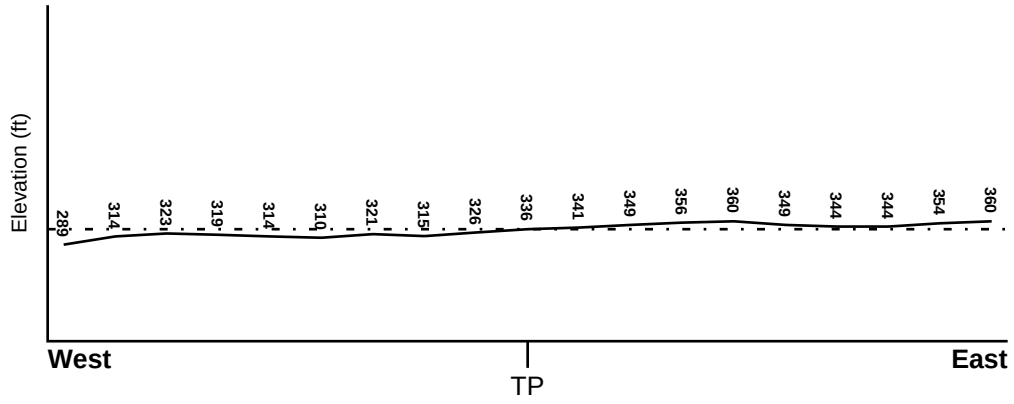
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General WNW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 336 ft.

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
PLACER, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property:	0607210001A - FEMA Q3 Flood data
Additional Panels in search area:	0602390418D - FEMA Q3 Flood data 0602420005C - FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
ROCKLIN	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

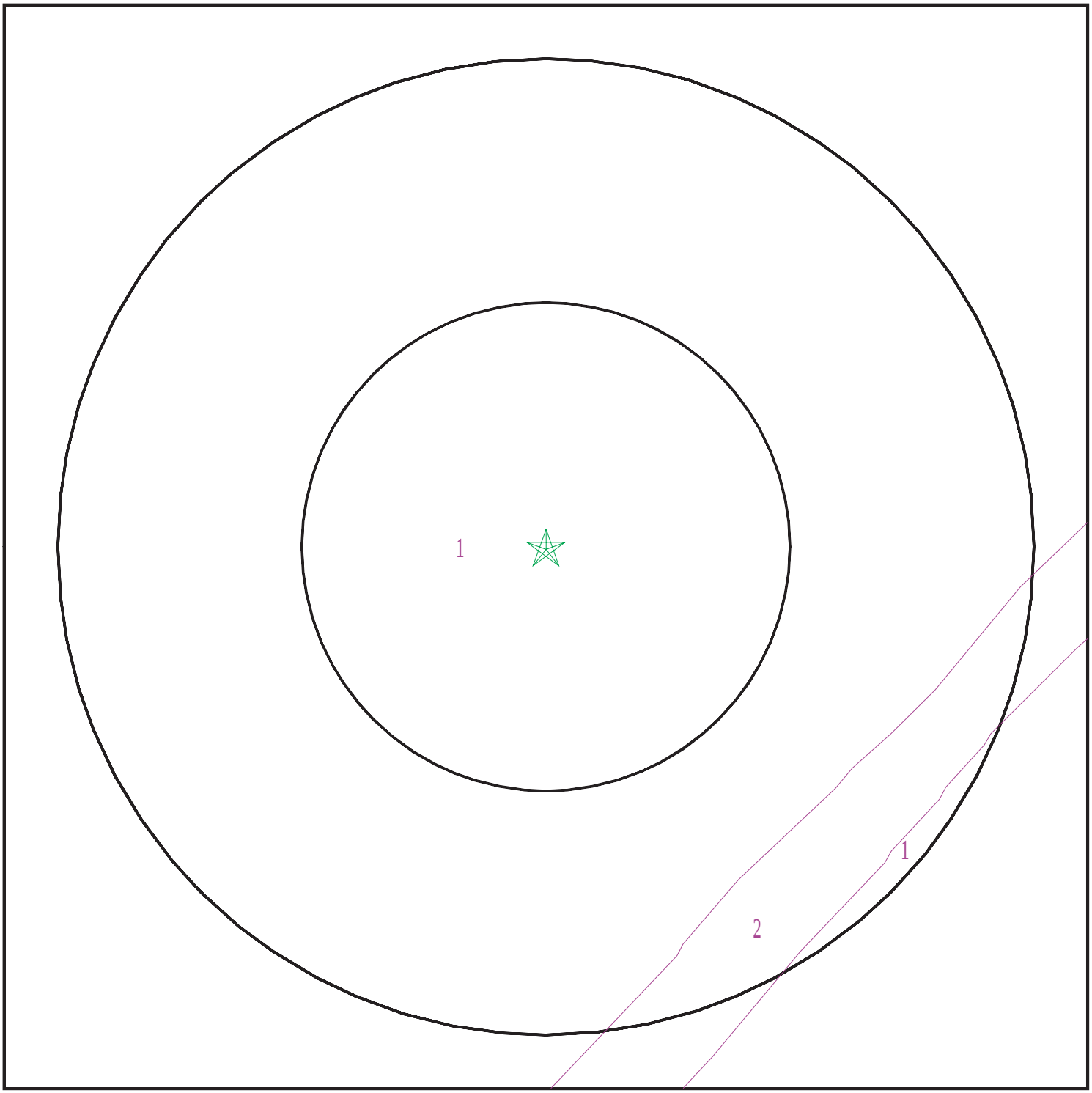
Era:	Mesozoic
System:	Jurassic
Series:	Jurassic
Code:	Jg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Jurassic granitic rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 4722099.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	SEC Brace Rd and Sierra College Blvd	CLIENT:	Kleinfelder, Inc.
ADDRESS:	SEC Brace Rd and Sierra College Blvd Loomis CA 95650	CONTACT:	Karin Hagan
		INQUIRY #:	4722099.2s
LAT/LONG:	38.809213 / 121.203369	DATE:	September 08, 2016 5:03 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: ANDREGG

Soil Surface Texture: coarse sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 5.6
2	14 inches	29 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 6.5 Min: 5.6
3	29 inches	33 inches	weathered bedrock	Not reported	Not reported	Max: 0.42 Min: 0	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: XERORTHENTS

Soil Surface Texture: variable

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	59 inches	variable	Not reported	Not reported	Max: Min:	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000190337	1/4 - 1/2 Mile NW
2	USGS40000190338	1/4 - 1/2 Mile NW
3	USGS40000190328	1/2 - 1 Mile East
4	USGS40000190285	1/2 - 1 Mile SE
A5	USGS40000190325	1/2 - 1 Mile West
B6	USGS40000190278	1/2 - 1 Mile ESE
7	USGS40000190317	1/2 - 1 Mile West
A8	USGS40000190330	1/2 - 1 Mile West
9	USGS40000190280	1/2 - 1 Mile ESE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

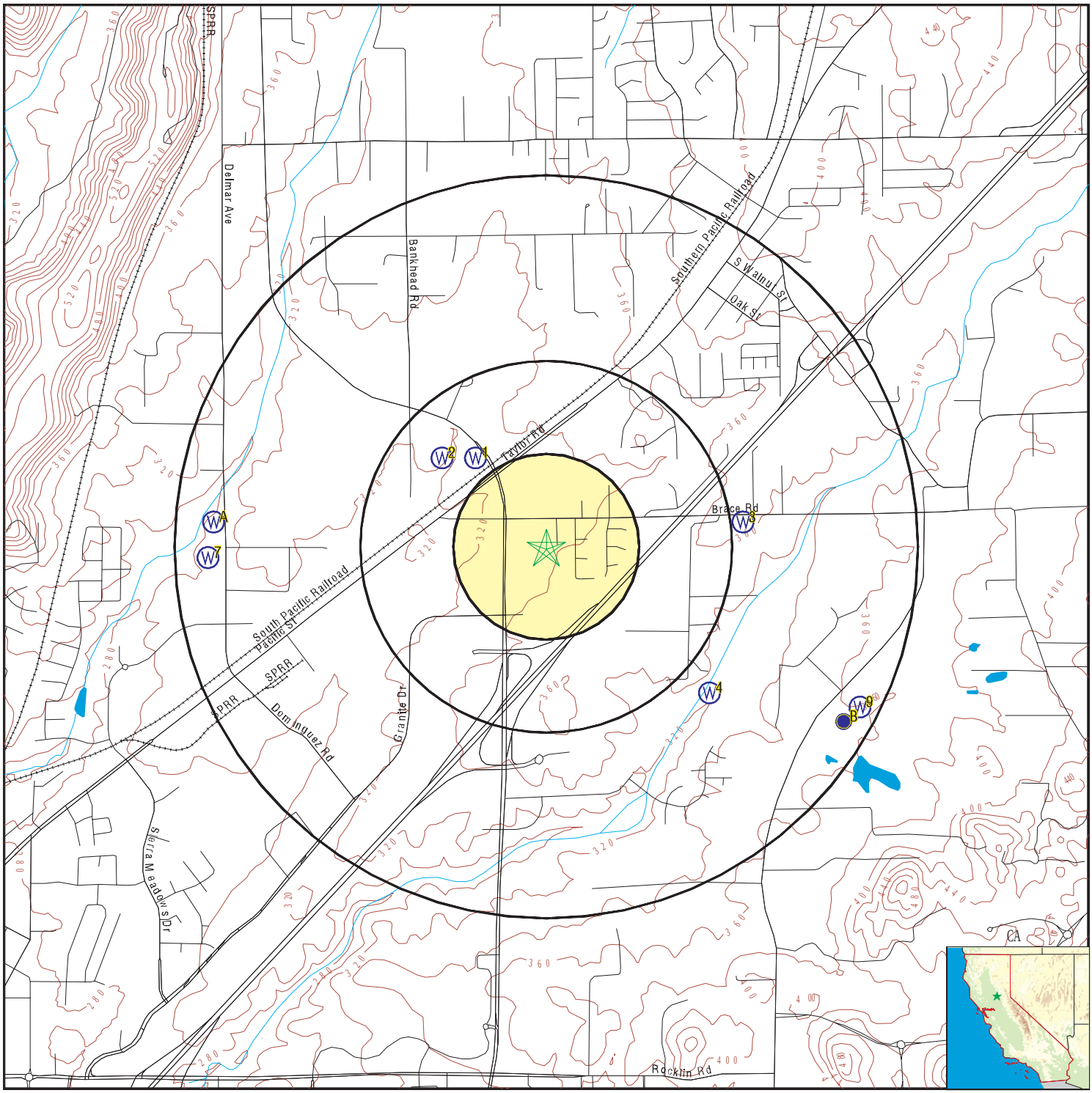
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B10	10382	1/2 - 1 Mile ESE

PHYSICAL SETTING SOURCE MAP - 4722099.2s



0 1/4 1/2 1 Miles

N

- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	SEC Brace Rd and Sierra College Blvd	CLIENT:	Kleinfelder, Inc.
ADDRESS:	SEC Brace Rd and Sierra College Blvd Loomis CA 95650	CONTACT:	Karin Hagan
		INQUIRY #:	4722099.2s
LAT/LONG:	38.809213 / 121.203369	DATE:	September 08, 2016 5:03 pm

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Map ID Direction Distance Elevation	Database	EDR ID Number
1 **NW** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000190337**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384846121122101		
Monloc name:	011N007E09N002M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.812678
Longitude:	-121.2068933	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	325.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19770209	Welldepth:	172
Welldepth units:	ft	Wellholedepth:	172
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1982-07-15	7.36	

Note: The site had been pumped recently.

---

2 **NW** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000190338**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384846121122701		
Monloc name:	011N007E09N001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.812678
Longitude:	-121.20856	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	320.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Basement Complex of Pretertiary Age		

Aquifer type:	Not Reported		
Construction date:	19761102	Welldepth:	75
Welldepth units:	ft	Wellholedepth:	75
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-07-15	6.44				
Note: The site had been pumped recently.					
1976-11-02	40.00				

3
East **FED USGS** **USGS40000190328**
1/2 - 1 Mile
Higher

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384837121113301		
Monloc name:	011N007E16A001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.810178
Longitude:	-121.1935596	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	380.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Basement Complex of Pretertiary Age		
Aquifer type:	Not Reported		
Construction date:	19771017	Welldepth:	173
Welldepth units:	ft	Wellholedepth:	173
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-07-21	14.36		1977-10-17	26.00	

4
SE **FED USGS** **USGS40000190285**
1/2 - 1 Mile
Lower

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384813121113901		
Monloc name:	011N007E16H001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.8035115
Longitude:	-121.1952262	Sourcemap scale:	24000

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	320.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19771220	Welldepth:	148
Welldepth units:	ft	Wellholedepth:	148
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-07-20	5.45				
Note: The site had been pumped recently.					
1977-12-20	14.00				

A5
West
1/2 - 1 Mile
Lower

FED USGS **USGS40000190325**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384836121130701		
Monloc name:	011N007E17C001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.8099002
Longitude:	-121.2196715	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	300.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19771118	Welldepth:	175
Welldepth units:	ft	Wellholedepth:	175
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1977-11-18	20.00	

Map ID Direction Distance Elevation	Database	EDR ID Number
B6 **ESE** **1/2 - 1 Mile** **Higher**	**FED USGS**	**USGS40000190278**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384810121111701		
Monloc name:	011N007E15M002M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.8026782
Longitude:	-121.1891149	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	355.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19770708	Welldepth:	175
Welldepth units:	ft	Wellholedepth:	175
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1977-07-08	30.00	

7 **West** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000190317**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384832121130901		
Monloc name:	011N007E17C002M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.8087891
Longitude:	-121.220227	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	305.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		

Aquifer type:	Not Reported		
Construction date:	19800328	Welldepth:	200
Welldepth units:	ft	Wellholedepth:	200
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1980-03-28	30.00	

A8
West
1/2 - 1 Mile
Lower

FED USGS **USGS40000190330**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384838121130901		
Monloc name:	011N007E08P001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.8104558
Longitude:	-121.220227	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	320.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19780724	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	200
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1982-07-15	5.15	

9
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40000190280**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-384811121111201		
Monloc name:	011N007E15M001M		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18020111	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	38.802956
Longitude:	-121.187726	Sourcemap scale:	24000

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	359.00
Vert measure units:	feet	Vertacc measure val:	10
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Other aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19770701	Welldepth:	175
Welldepth units:	ft	Wellholedepth:	175
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1977-07-01	60.00	

B10
ESE
1/2 - 1 Mile
Higher

CA WELLS **10382**

Water System Information:

Prime Station Code:	11N/07E-15M03 M	User ID:	31C
FRDS Number:	3100062001	County:	Placer
District Number:	61	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	384808.0 1211113.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	C.C. WELL		
System Number:	3100062		
System Name:	INDIAN CREEK COUNTRY CLUB		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
95650	17	0

Federal EPA Radon Zone for PLACER County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 95650

Number of sites tested: 6

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.817 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX C
USER PROVIDED AND REGULATORY AGENCY DOCUMENTATION

SIRE CAPTURE SEPARATOR PAGE

VALUE: PAGESEPARATOR

Cabinet to File in	APN (no dashes, 12 characters)	Permit Type	Permit Number	Doc Type
ENV	045042036000	4200	045042036000	31
		Historical Septic & Well Permits		ENV - Historical

File Name

ENV;045042036000;4200;045042036000;31

Laura Rath

From: Laura Rath
Sent: Tuesday, July 07, 2009 1:27 PM
To: 'kkerdus@loomis.ca.gov'
Subject: FW: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

Kathy,

I have reviewed the APN files for the above parcels and there is no reference of contamination. The only information in our file is an application for a rezone and EIAQ. Let me know if you have any additional questions.

Thanks,
Laura Rath

From: Susan Leland
Sent: Tuesday, July 07, 2009 12:22 PM
To: Laura Rath
Subject: FW: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

I have pulled the APN's and put them on your desk for review & comment to the Town of Lommis
Thanks,
Susan

From: Jill Pahl
Sent: Tuesday, July 07, 2009 10:03 AM
To: Susan Leland
Cc: Leslie Lindbo
Subject: FW: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

Susan, can you take a look at the APNs?

Environmental Health,
Touching Everyone's Life Everyday

Jill Pahl, R.E.H.S.
Placer County Environmental Health Director
3091 County Center Drive, Suite 180
Auburn, CA 95604
(530) 745-2341

jpahl@placer.ca.gov

From: Virginia Lineberry
Sent: Tuesday, July 07, 2009 9:47 AM
To: 'kkerdus@loomis.ca.gov'
Cc: Jill Pahl; Leslie Lindbo
Subject: FW: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

Kathy,

We have reviewed our hazardous materials files and found nothing referring to contamination of the above sites.

(see below) The land team may have other information to check.

Virginia Lineberry

From: West Bourgault
Sent: Tuesday, July 07, 2009 9:32 AM
To: Virginia Lineberry
Subject: RE: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

Virginia-
First, I assumed the last APN referenced is actually 037. I looked in the site mitigation files, the EH AP files downstairs and on Geotracker. I did not find a file for the subject APNs in the site mitigation files or on Geotracker I found an EH AP file for 045-042-036 and 037 but it appears to be related to a re-zone and not groundwater contamination.

There are 3 former underground storage tank sites located south of the property (7-Eleven, Former Chevron and Former Unocal). Each of these sites were closed by the Central Valley Regional Water Quality Control Board as "low risk" sites.

If the Town of Loomis would like a complete history of the subject parcels, it could have a qualified consultant prepare a Phase I Site Assessment.

Let me know if you have any additional questions.
West

From: Virginia Lineberry
Sent: Tuesday, July 07, 2009 7:24 AM
To: West Bourgault
Subject: FW: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

West,

Could you check into this from the haz mat end? Let me know what you find (or don't find)

Thanks!

From: Brian Jones
Sent: Tuesday, July 07, 2009 7:08 AM
To: Virginia Lineberry
Cc: Jill Pahl; Leslie Lindbo; 'Kathy Kerdus'
Subject: FW: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

---

From: Kathy Kerdus [mailto:kkerdus@loomis.ca.gov]
Sent: Monday, July 06, 2009 11:20 AM
To: Brian Jones
Subject: Loomis - APNs 045-042-034,035,036, and 036, Sierra College south of Brace

Hi Brian- Hope all is going well. Since you are the "easy send" for me at Placer County and know the appropriate people to send this on to- would you please send on to the right person regarding a 1990-1991 finding of 3 contaminated acquifers on the above listed properties? Thank you so much!

I received a call this morning about one of the sites the Town is considering for affordable housing (APNs above). Evidently the person's son worked for an environmental driller in 1990-1991 and the subject site, along with the adjacent McDonalds and Circle K sites were found to have 3 acquifers underneath which were so contaminated, that it was found that it was "not suitable for even cattle to graze on"... Is there some way I can verify this – or respond to the concern? Incidentally, the verified wetlands report for the site shows minimal wetlands. Thank you so much – Kathy Kerdus (916-652-1840), Planning Director, Town of Loomis.

SPEED MEMO

PLACER COUNTY ENVIRONMENTAL HEALTH DIVISION
11484 B Avenue
Auburn, CA 95603 Phone: (916) 823-4361

AP# 45 042 36 ; 37 DATE 6-7-89

FILE#

SUBJECT #89-15, Sunrise Marketing, General Plan Amendment, Rezone, EIAQ

TO: Town of Loomis
P.O. Box 1327
Loomis, CA 95650

ATTENTION: Cathleen Spence-Wells
(Recipient: Write reply, return white to sender, keep the pink copy.)

MESSAGE: Environmental Health has reviewed the application for a development permit for the above referenced project and has the following comments. South Placer Municipal Utility District has indicated there is a sewer line available for the subject parcels. Placer County Water Agency has indicated there is a treated water main at the intersection of Sierra College Blvd and Brace Rd. It appears that a pipeline extension agreement between the applicants and PCWA will be required. Environmental Health requests that the Town consider connection to public sewer and treated public water as a condition in the processing of the development application. Environmental

SIGNED D Kuselman 889 7363

REPLY: Health also requests consideration of the standard hazardous materials and underground tank conditions (please see attached).

1-81 SIGNED

Town Of Loomis

P. O. Box 1327
Loomis, CA 95650
(916) 652-9204

May 31, 1989

45-042-36 & 37

RECEIVED
PLACER COUNTY

JUN 02 1989

ENVIRONMENTAL HEALTH

County of Placer
Environmental Health
11484 B Avenue
Auburn, CA 95603

Attention: John Miners

SUBJECT: **#89-15**
SUNRISE MARKETING
GENERAL PLAN AMENDMENT
REZONE
EIAQ

Gentlemen:

The Town of Loomis has received an application for a development permit for the above referenced project. A copy of the application and tentative map are enclosed.

We have tentatively scheduled this item for the **JULY 5 , 1989** Planning Commission Public Hearing. We would appreciate hearing from you within **10 working days** regarding any concerns your agency may have with the proposed development or any conditions you would wish the Town to consider in its processing for the development application.

Yours truly,

Cathleen Spence-Wells

Cathleen Spence-Wells
Planning Director

Enclosures: 4

CSW/bjb

MLT. 6-2-89
Please distribute to ~~other~~ LDT for they're comment.
Also include standard Hoe mat condition and standard UGT condition thanks

6140 HORSESHOE BAR ROAD, SUITE K, LOOMIS, CA 95650

TOWN OF LOOMIS
P. O. BOX 1327
LOOMIS, CA 95650
(916)652-9204

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MAY 9 1989
TOWN OF LOOMIS

Check One

General Plan Amendment Application ✓

Rezoning Application ✓

(Combined General Plan Amendments and Zoning Amendments can be processed concurrently and are charged a combined, reduced application fee.)

Required Maps 25

Required Applications 1

Filing Fee $2000.00 (see current fee schedule) + $ 430.00 FOR E.I.A.Q.

1. Property Owner PHILLIP L. WARD, BRUCE D. CAMERON AND DENISE L. CAMERON AND DONALD JURGENSON
   Telephone 916-988-7878
   Address 9256 MADISON AVENUE, ORANGEVALE, CA., 95662
2. Applicant/Agent FRONTIER LAND DEVELOPMENT CO.
   Telephone 916 652-0475
   Address 5900 KING RD. LOOMIS, CA., 95650
3. Existing General Plan designation RESIDENTIAL-HIGH DENSITY AND COMMERCIAL
4. Proposed General Plan designation COMMERCIAL.
5. Existing Zoning R-2-A-DL-8
6. Proposed Zoning COMMERCIAL
7. Assessor's Parcels Nos. 45-042-36 & 37
8. Size of Property (acreage or square feet) 6.73 AC.
9. Describe project location in detail and ATTACH VICINITY MAP - SIERRA COLLEGE BLVD. 1/4 WEST OF I-80

10. Description of Request TO CHANGE THE EXISTING ZONING OF RESIDENTIAL-HIGH DENSITY TO COMMERCIAL.

11. State basis and/or reasons for request (see attached filing instructions) THE CHANGE IN ZONING WOULD BE MORE CONDUSIVE TO THAT OF THE SURROUNDING PROPERTIES TO THE SOUTH AND WEST

12. Please submit twenty-five (25) copies of a General Plan Amendment Exhibit or twenty-five (25) copies of a Zoning Amendment Exhibit or both, if appropriate for the requested action. The Exhibits should clearly show the present and Proposed General Plan Category or Zoning District Boundaries with the appropriate designations labeled for the subject and all surrounding properties. (See attached filing instructions). **Please submit one reduced 8½" x 11" transparency of the exhibit(s).**

13. For Commercial or Industrial Zoning Amendments, please submit a detailed plot plan. (See attached filing instructions).

14. Please submit a Property Owners' list and a 300 foot radius map. (See attached filing instructions).

15. Please submit a copy of the latest Deed(s) for the property from the official records of the County. The person holding the Deed must sign the application,(or submit a letter authorizing his Agent to do so).

Bruce D. Cameron

SIGNATURE OF APPLICANT

Town Of Loomis

P. O. Box 1327
Loomis, CA 95650
(916) 652-9204

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MAY 9 1989
TOWN OF LOOMIS

ENVIRONMENTAL REVIEW APPLICATION

Applicant to submit 10 copies of application with other requested permits.

ENVIRONMENTAL REVIEW APPLICATION

Date Filed 4-3-89

General Information

1. Name and address of developer or project sponsor: SUNRISE MARKETING GROUP, 9256 MADISON AVE., ORANGEVALE CA. 95662

2. Address of project: SIERRA COLLEGE BLVD. LOOMIS
Assessor's Block and Lot Number: 45-042-36 & 37

3. Name, address, and telephone number of person to be contacted concerning this project: BILL ROSS, FRONTIER LAND DEVELOPMENT CO 5900 King RD. LOOMIS, CA 95650 (916) 652-0475

4. Indicate number of the permit application for the project to which this form pertains: N/A

5. List and describe any other related permits and other public approvals required for this project, including those required by city, regional, state and federal agencies: GENERAL PLAN AND REZONING AMENDMENT

6. Existing zoning district: R-2-A-DL-8

7. Proposed use of site (Project for which this form is filed): COMMERCIAL/ BUISNESS PROFESSIONAL OFFICES

Project Description

8. Site size. 6.8 ACRES ±

9. Square footage. 296,000 # ±

10. Number of floors of construction. N/A

11. Amount of off-street parking provided. N/A

12. Attach plans. N/A

13. Proposed scheduling. N/A

14. Associated project. NONE

15. Anticipated incremental development. NONE

16. If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected. N/A

17. If commercial, indicate the type, whether neighborhood, city or regionally oriented, square footage of sales area, and loading facilities. N/A

18. If industrial, indicate type, estimated employment per shift, and loading facilities. N/A

19. If institutional, indicate the major function, estimated employment per shift, estimated occupancy, loading facilities, and community benefits to be derived from the project. N/A

20. If the project involves a variance, conditional use or rezoning application, state this and indicate clearly why the application is required.

Are the following items applicable to the project or its effects? Discuss below all items checked yes (attach additional sheets as necessary).

	Yes	No
21. Change in existing features of any bays, tidelands, beaches, or hills, or substantial alteration of ground contours.		✓
22. Change in scenic views or vistas from existing residential areas or public lands or roads.		✓
23. Change in pattern, scale or character of general area of project.		✓
24. Significant amounts of solid waste or litter.		✓
25. Change in dust, ash, smoke, fumes or odors in vicinity.		✓
26. Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns. SOME DRAINAGE PATTERNS MAY REQUIRE RELOCATION AND CHANNELIZATION	✓	
27. Substantial change in existing noise or vibration levels in the vicinity.		✓
28. Site on filled land or on slope of 10 percent or more.		✓
29. Use of disposal of potentially hazardous materials, such as toxic substances, flammables or explosives.		✓
30. Substantial change in demand for municipal services (police, fire, water, sewage, etc.).		✓
31. Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.).		✓
32. Relationship to a larger project or series of projects.		✓

Environmental Setting

33. Describe the project site as it exists before the project, including information on topography, soil stability, plants and animals, and any cultural, historical or scenic aspects. Describe any existing structures on the

site, and the use of th structures. THE PROJECT IS C RENTLY ON VACANT LAND WITH NO BUILDINGS. T PROJECT SLOPES WESTWARD @ 2% SLOPE ON S DECOMPOSED GRANITE SOIL. THE VEGITATION CONSISTS OF GRASSES, OAKS, COTTONWOOD & RIPARIAN PLANTS

34. Describe the surrounding properties, including information on plants and animals and any cultural, historical or scenic aspects. Indicate the type of land use (residential, commercial, etc.), intensity of land use (one-family, apartment houses, shops, department stores, etc.), and scale of development (height, frontage, set-back, rear yard, etc.). TO THE EAST EXISTS A 39 LOT RESIDENTIAL SUBDIVISION. TO THE SOUTH EXISTS VACANT COMMERCIAL LAND WITH A GAS STATION. TO THE WEST EXISTS VACANT COMMERCIAL LAND AND A MEDICAL SUPPLY BLDG. TO THE NORTH EXISTS VACANT RESIDENTIAL LAND (R2-A-DL-B) AND APARTMENTS. THERE ARE NO ENDANGERED PLANTS OR ANIMALS KNOWN TO THIS AREA. THE ANIMALS FOUND ARE SQUIRRELS, POSSUM, RACCOON, GOPHER, VARIOUS BIRD SPECIES, MICE AND RATS

Certification

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and in formation presented are true and correct to the best of my knowledge and belief.

4/19/89
Date

William J Ward
Signature

For PHIL WARD, BRUCE CAMERON & DONALD JORGENSON

their AGENT

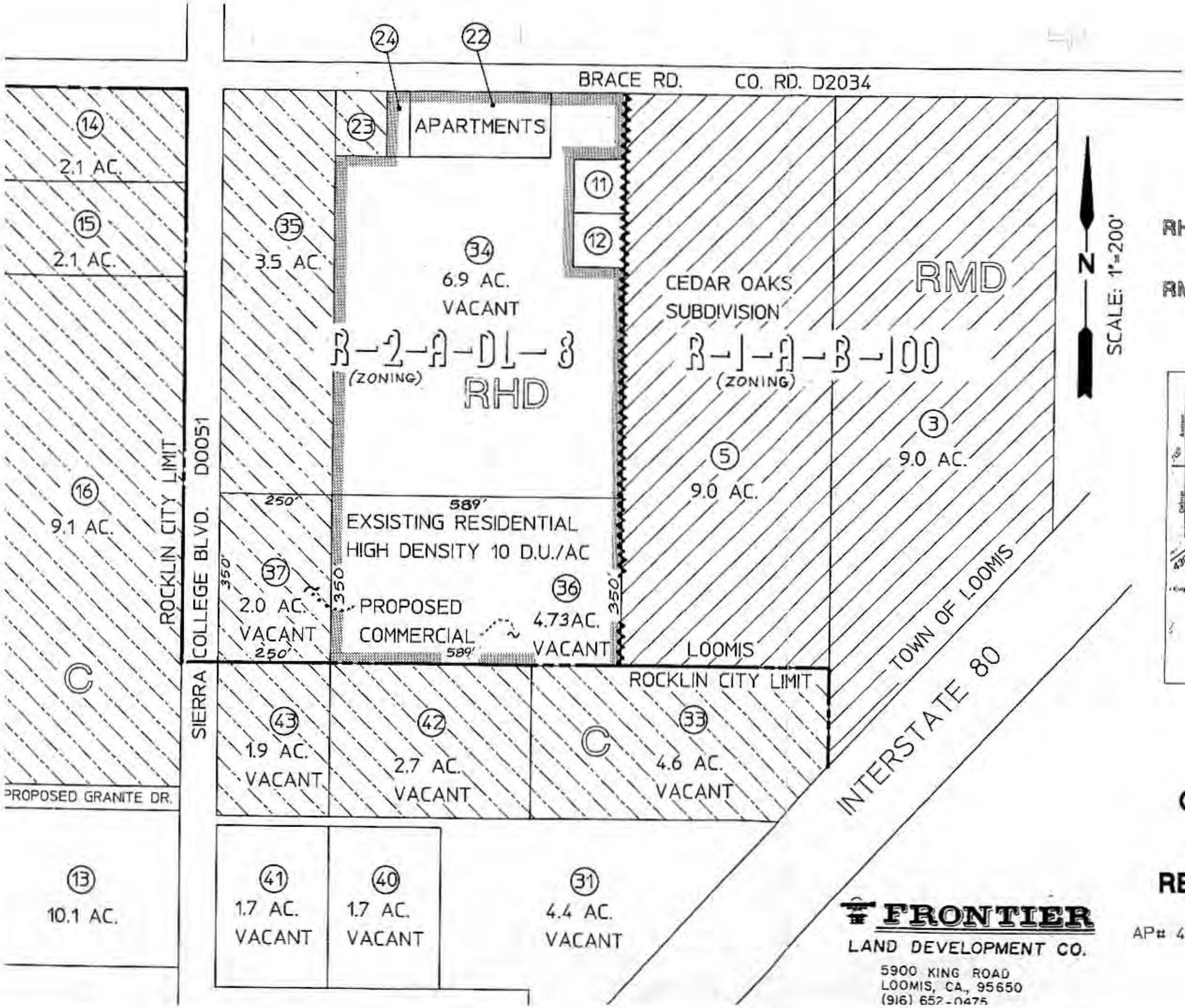
SIRE CAPTURE SEPARATOR PAGE

VALUE: PAGESEPARATOR

Cabinet to File in	APN (no dashes, 12 characters)	Permit Type	Permit Number	Doc Type
ENV	045042036000	4200	045042036000	25
		Historical Septic & Well Permits		ENV - Plans and Maps

File Name

ENV;045042036000;4200;045042036000;25



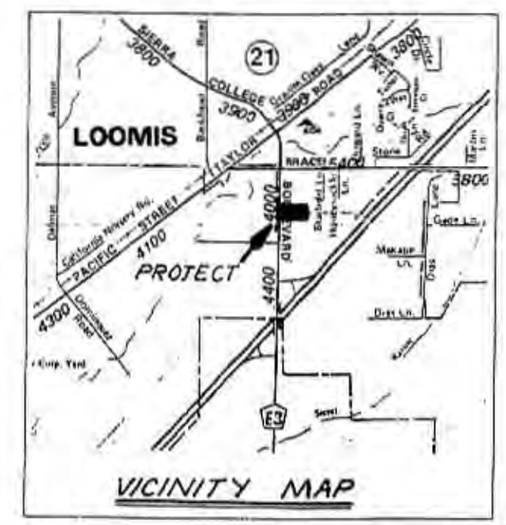
GENERAL PLAN LEGEND

LOOMIS ZONING CHANGE LINE

C — EXISTING COMMERCIAL

RHD — RESIDENTIAL HIGH DENSITY 10 D.U./AC

RMD — RESIDENTIAL MEDIUM DENSITY 4 D.U./AC.



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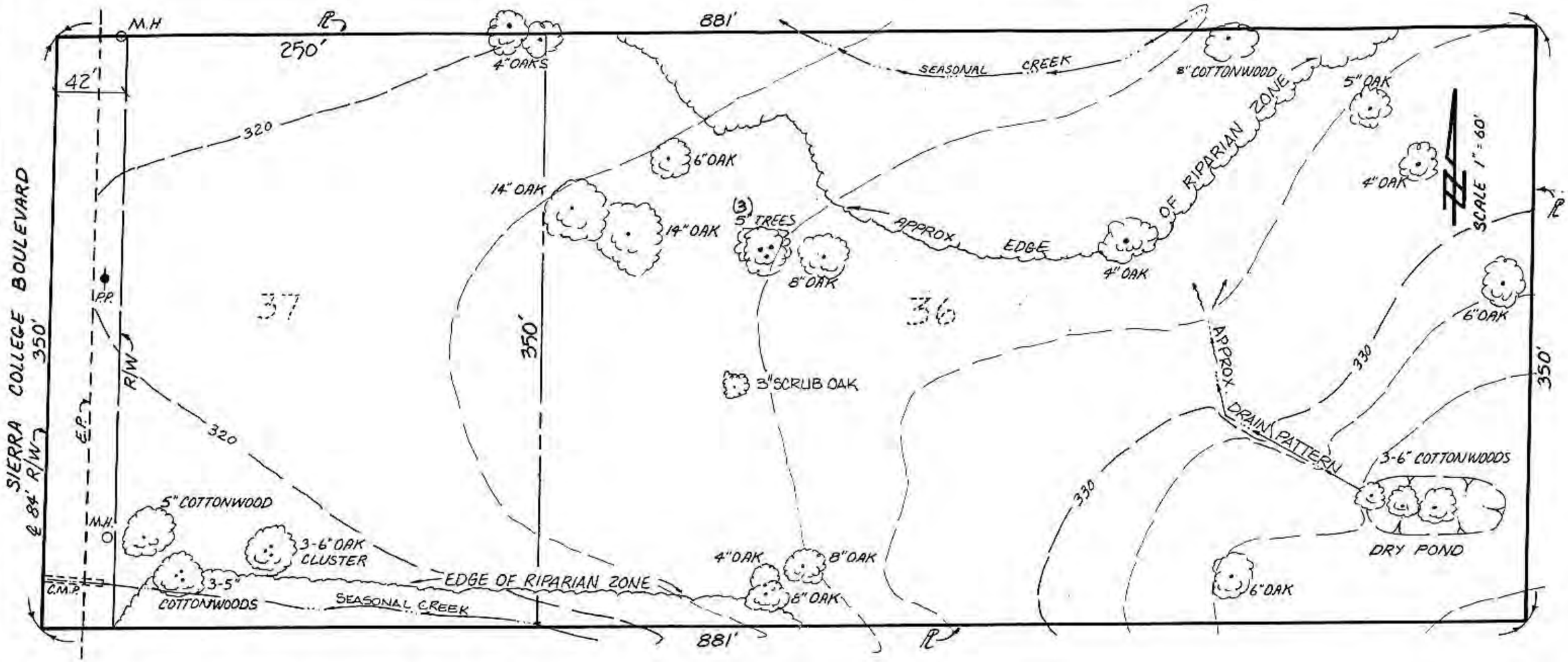
TOWN OF LOOMIS

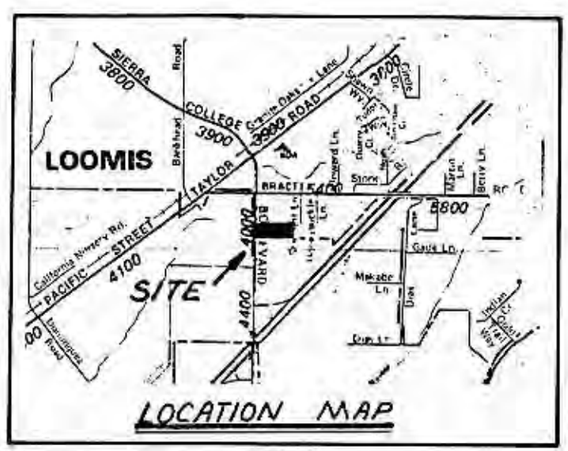
PROPOSED

GENERAL PLAN AND REZONING EXHIBIT

AP# 45-042-36/37 TOWN OF LOOMIS

FRONTIER
LAND DEVELOPMENT CO.
5900 KING ROAD
LOOMIS, CA., 95650
(916) 652-0475





LOCATION MAP

SITE PLAN

FOR

AP# 45-042-36 & 37

APRIL 1989 TOWN OF LOOMIS

RECEIVED
MAY 9 1989
TOWN OF LOOMIS

FRONTIER

LAND DEVELOPMENT CO.

5900 KING ROAD
LOOMIS, CA., 95650
(916) 652-0475

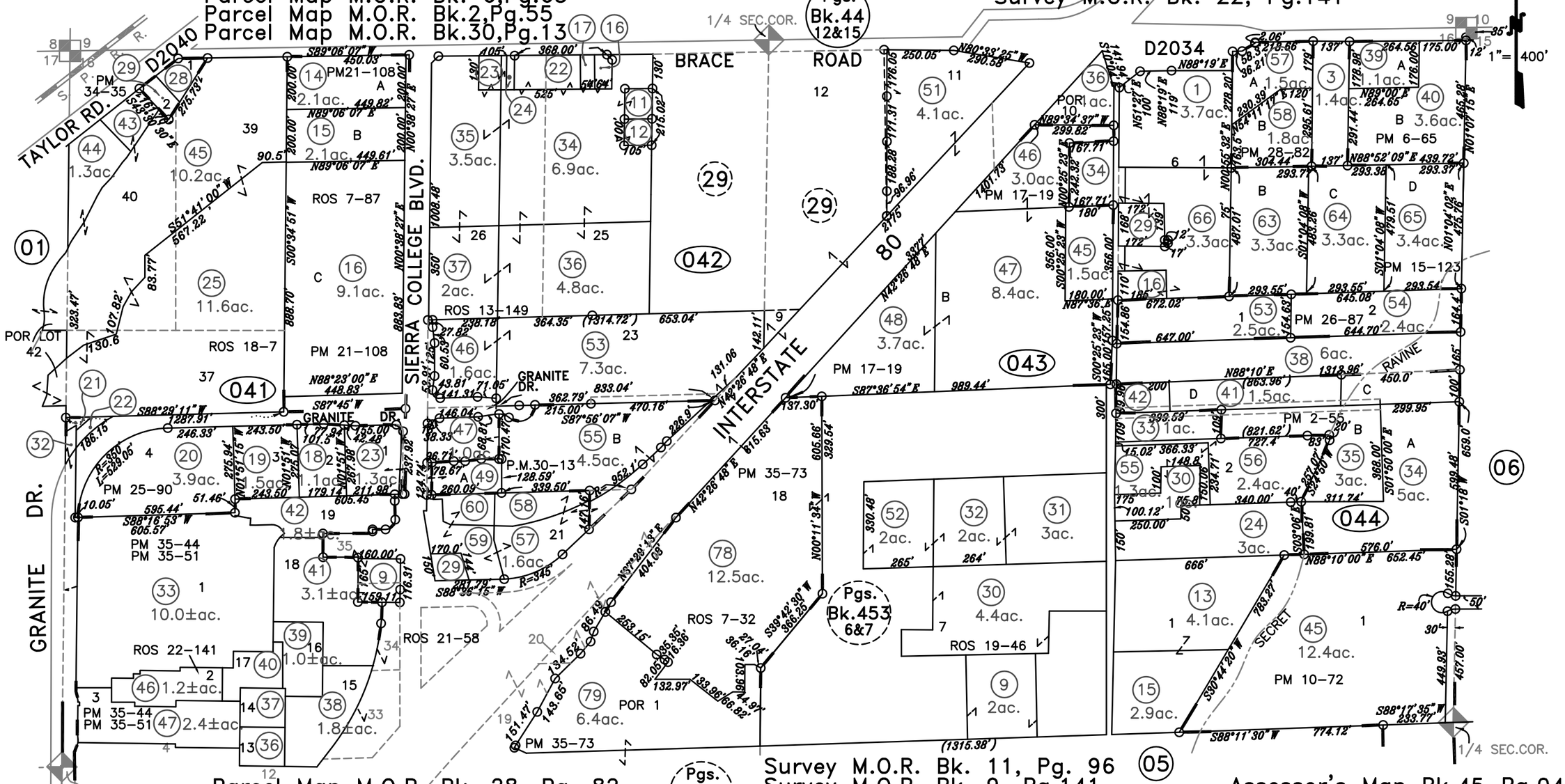
N. 1/2 SEC. 16, T.11N., R.7E., M.D.B.& M.

45–04

Parcel Map M.O.R. Bk.13,Pg.150
Parcel Map M.O.R. Bk.10,Pg.72
Parcel Map M.O.R. Bk. 6,Pg.65
Parcel Map M.O.R. Bk.2,Pg.55
Parcel Map M.O.R. Bk.30,Pg.13

Himes Tract M.O.R.Bk.A,Pg.30

Survey M.O.R. Bk. 18, Pg.7
Survey M.O.R. Bk. 18, Pg.114, No.2661
Survey M.O.R. Bk. 22, Pg.141



Parcel Map M.O.R. Bk. 28, Pg. 82
Parcel Map M.O.R. Bk. 25, Pg. 90
Parcel Map M.O.R. Bk. 21, Pg. 108
Parcel Map M.O.R. Bk.17, Pg. 19
Parcel Map M.O.R. Bk.15, Pg. 123
Survey M.O.R. Bk. 13, Pg. 149
Survey M.O.R. Bk. 19, Pg. 46 #2622
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Survey M.O.R. Bk. 11, Pg. 96
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Survey M.O.R. Bk. 6, Pg. 05
Survey M.O.R. Bk. 6, Pg. 143
Parcel M.O.R. Bk.34, Pg.35, No.0617
Parcel M.O.R. Bk.35, Pg.44, DL–2006–07
Parcel M.O.R.Bk.35,Pg.51,DL–2006–07(Amended)
Parcel M.O.R.Bk.35,Pg.73,DL–2005–06

08–16–2013
02–25–2010
02–24–2010
08–19–2009
08–17–2009
02–07–2008
02–06–2008
01–11–2008
11–26–2007
10–15–2007
01–03–2007
08–28–2006
04–15–2003
02–14–2001
08–17–2000
03–09–99 SKS
Page Redrawn Per Basemap Information.

03–18–2016
12–10–2015
04–02–2015
02–06–2015
01–15–2015
10–15–2014
10–30–2013
08–30–2013
08–23–2013

NOTE
All distances on curved lines are chord measurements.

Assessor's Map Bk.45 Pg.04
County of Placer, Calif.

NOTE

This map was prepared for assessment purposes only, and is not intended to illustrate legal building sites or establish precedence over local ordinances. Official information concerning size or use of any parcel should be obtained from recorded documents and local governing agencies.

NOTE
Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles.

SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

Inquiry Number: 4722099.6
September 08, 2016

The EDR Property Tax Map Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Property Tax Map Report

Environmental Data Resources, Inc.'s EDR Property Tax Map Report is designed to assist environmental professionals in evaluating potential environmental conditions on a target property by understanding property boundaries and other characteristics. The report includes a search of available property tax maps, which include information on boundaries for the target property and neighboring properties, addresses, parcel identification numbers, as well as other data typically used in property location and identification.

NO COVERAGE

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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Karin Hagan

From: Karin Hagan
Sent: Thursday, September 08, 2016 12:46 PM
To: 'rgannon@loomis.ca.gov'
Subject: File review request

Good afternoon Rhonda,

I'm working on an environmental assessment for a property in Loomis, and as part of that assessment I need to review any records regarding permits or improvements (buildings, tanks, pipelines, septic systems, etc.) on the property.

Do you/the Town keep such files, and what is the best way for me to obtain copies or review them in person?

The property in question is located on the southeastern corner of Brace Road and Sierra College Boulevard, and includes the following APNs:
045-042-034-000
045-042-035-000
045-042-036-000
045-042-037-000

Thank you,
Karin

Karin Hagan, GISP, CEM (NV)
GIS and Environmental Professional
NEW NUMBER
d| 703-509-5941

Request for Records under the California Public Records Act
(Section 6250, et. sec. of the California Government Code)

While the California Public Records Act (PRA) does not require that a request to review files or to obtain copies of public documents be submitted in writing, the completion of this form will allow staff to perform the required research and provide you with the most complete and accurate documentation possible. We are asking for your name and contact information only to facilitate communication necessary to perform our research and notify you when this research is complete. **Please complete (1) form for each parcel and/or project.**

Property Address: None

Assessor's Parcel Number: 045-042-034-000; 045-042-035-000; 045-042-036-000; 045-042-037-000

Requestor Name: Karin Hagan Phone: 703-509-5941

Email Address: khagan@kleinfelder.com

The following records are requested:

BUILDING SERVICES DIVISION:

☒ Permits

☐ Permit Numbers (if known): _____

☒ Inspection Records

☒ Plans

The release of copies of plans prepared and stamped by a registered professional (California Registered Engineer, California Registered Architect) requires a release from the registered professional. Furthermore, these plans may only be released after a declaration is completed confirming the plans will be used solely for maintenance and repair under California Health & Safety Code 19850-19853

☐ Other: _____

PLANNING SERVICES DIVISION:

☒ Land Use Entitlements (Use Permits, Minor Land Divisions, Subdivisions, Variances, Etc.)

☐ Project/File Numbers (if known): _____

☐ Other: _____

ENGINEERING AND SURVEYI NG DIVISION:

☒ Permits

☐ Permit/Project Number (if known): _____

☒ Improvement Plans

The release of copies of plans prepared and stamped by a registered professional (California Registered Engineer, California Registered Architect) requires a release from the registered professional. Furthermore, these plans may only be released after a declaration is completed confirming the plans will be used solely for maintenance and repair under California Health & Safety Code 19850-19853

☐ Other: _____

NOTE: The Community Development Resource Agency (CDRA) is comprised of the Building Services Division, Planning Services Division and the Engineering & Surveying Division. The Placer County Health & Human Services Department/Environmental Health Division and the Placer County Department of Public Works may also contribute information to permit and project files processed by CDRA and there may be records contained in our files; however for complete information from these Departments, a separate records request should be made directly to those Departments.

FOR DEPARTMENT USE ONLY (ACCELA UPDATES REQUIRED)

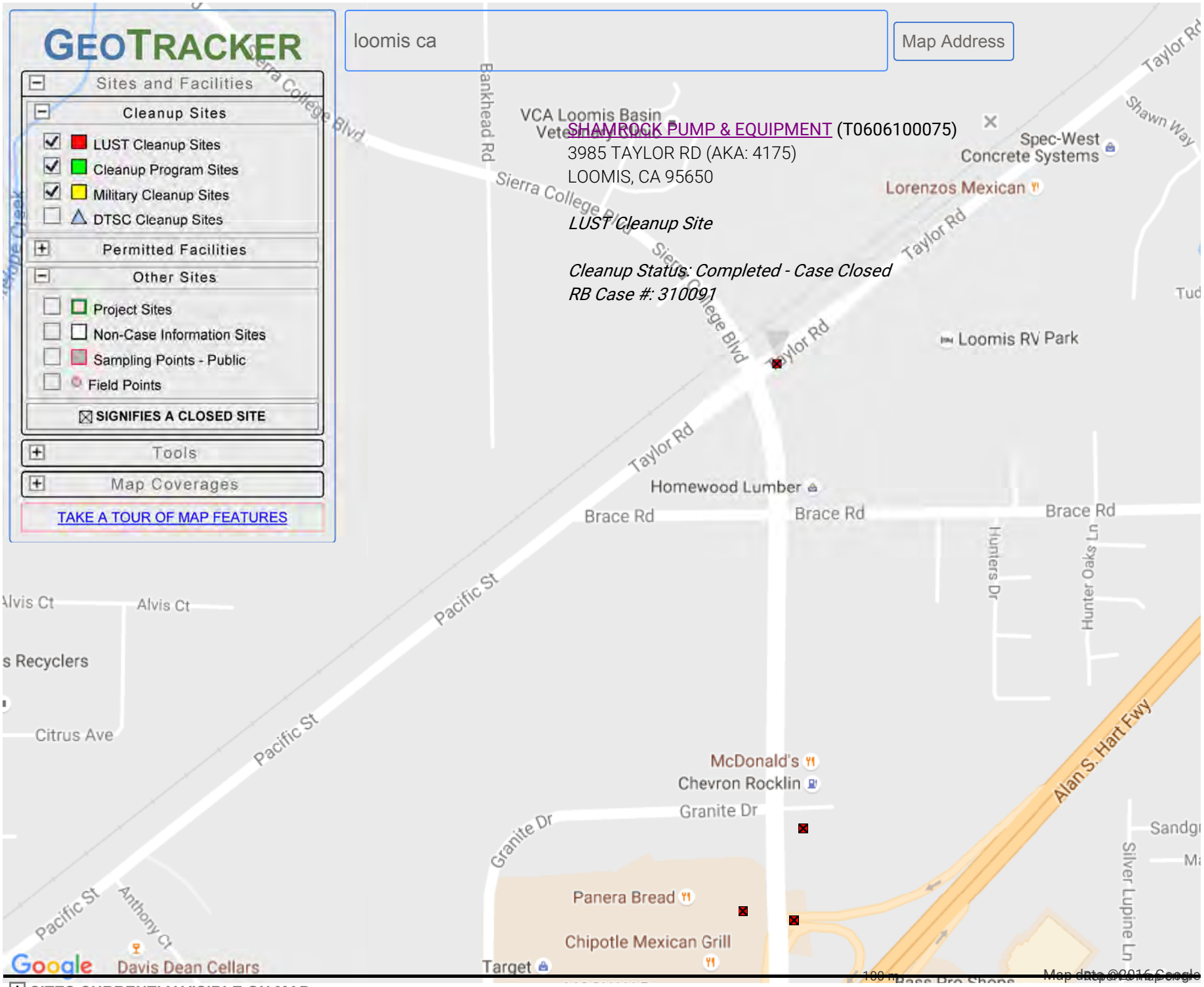
PROCESSING

☐ ACCELA RECORD INITIATED
☐ FILES GATHERED
☐ PROCESSED BY: _____
☐ FILES PULLED
☐ FILES REVIEWED FOR REDACTED INFORMATION: _____

_____

COMPLETION

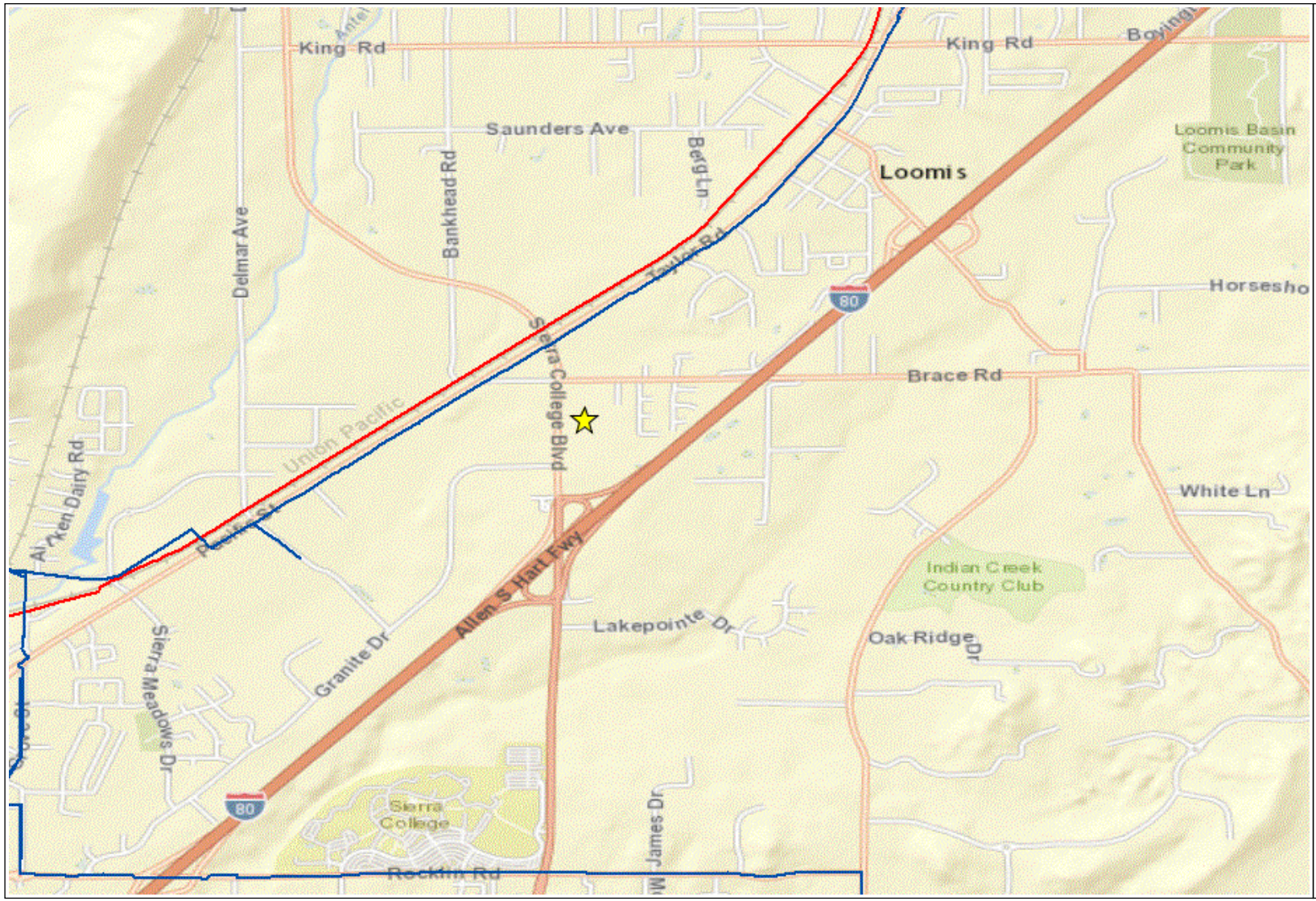
☐ REQUESTOR NOTIFIED
☐ FILES REVIEWED
☐ COPIES PROVIDED



SITES CURRENTLY VISIBLE ON MAP

Pipeline and Hazardous Materials Safety Administration

NATIONAL PIPELINE MAPPING SYSTEM



Legend

- Gas Transmission Pipelines
- Hazardous Liquid Pipelines

0 0.2 Miles

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms-nr@mbakercorp.com.

Projection: Geographic

Datum: NAD83

Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov

Date Printed: Sep 08, 2016

811 Know what's below. Call before you dig.

KLEINFELDER
Bright People. Right Solutions.

ASTM E1527-13
Phase I Environmental Site Assessment
User Questionnaire

INTRODUCTION

In order to qualify for one of the *Landowner Liability Protections (LLPs)*[1] offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "*Brownfields Amendments*"),[2] the *user* must conduct the following inquiries required by 40 CFR 312.25, 312.28, 312.29, 312.30, and 312.31. These inquiries must also be conducted by EPA Brownfield Assessment and Characterization grantees. The *user* should provide the following information to the *environmental professional*. Failure to conduct these inquiries could result in a determination that "*all appropriate inquiries*" is not complete.

(1.) Environmental liens that are filed or recorded against the *property* (40 CFR 312.25).

Did a search of *recorded land title records* (or judicial records where appropriate, see *Note 1* below) identify any environmental liens filed or recorded against the *property* under federal, tribal, state or local law?

HAVE NOT PERFORMED SEARCH

Note 1—In certain jurisdictions, federal, tribal, state, or local statutes, or regulations specify that environmental liens and AULs be filed in judicial records rather than in land title records. In such cases judicial records must be searched for environmental liens and AULs.

(2.) Activity and use limitations that are in place on the *property* or that have been filed or recorded against the *property* (40 CFR 312.26(a)(1)(v) and vi)).

Did a search of *recorded land title records* (or judicial records where appropriate, see *Note 1* above) identify any AULs, such as *engineering controls*, land use restrictions or *institutional controls* that are in place at the *property* and/or have been filed or recorded against the *property* under federal, tribal, state or local law?

HAVE NOT PERFORMED SEARCH

(3.) Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).

Do you have any specialized knowledge or experience related to the *property* or nearby properties? For example, are you involved in the same line of business as the current or former *occupants* of the *property* or an *adjoining property* so that you would have specialized knowledge of the chemicals and processes used by this type of business?

No

[1] *Landowner Liability Protections*, or *LLPs*, is the term used to describe the three types of potential defenses to Superfund liability in EPA's *Interim Guidance Regarding Criteria Landowners Must Meet in Order to Qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner Limitations on CERCLA Liability* ("*Common Elements*" Guide) issued on March 6, 2003.
[2] P.L. 107-118.

(4.) Relationship of the purchase price to the fair market value of the *property* if it were not contaminated (40 CFR 312.29).

Does the purchase price being paid for this *property* reasonably reflect the fair market value of the *property*? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the *property*?

Do not know

(5.) Commonly known or *reasonably ascertainable* information about the *property* (40 CFR 312.30).

Are you aware of commonly known or *reasonably ascertainable* information about the *property* that would help the *environmental professional* to identify conditions indicative of releases or threatened releases?

No

For example,

(a.) Do you know the past uses of the *property*?

No

(b.) Do you know of specific chemicals that are present or once were present at the *property*?

No

(c.) Do you know of spills or other chemical releases that have taken place at the *property*?

No

(d.) Do you know of any environmental cleanups that have taken place at the *property*?

No

(6.) The degree of obviousness of the presence or likely presence of contamination at the *property*, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).

Based on your knowledge and experience related to the *property* are there any *obvious* indicators that point to the presence or likely presence of releases at the *property*?

No

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Bright People. Right Solutions.

ASTM E1527-13
Phase I Environmental Site Assessment
User Questionnaire

In addition, certain information should be collected, if available, and provided to the *environmental professional* conducting the *Phase I Environmental Site Assessment*. This information is intended to assist the *environmental professional*, but is not necessarily required to qualify for one of the *LLPs*. The information includes:

(a) the reason why the Phase I is being performed, PERFORMANCE OF DUE DILIGENCE

(b) the type of *property* and type of *property* transaction, for example, sale, purchase, exchange, etc., SALES

(c) the complete and correct address for the *property* (a map or other documentation showing *property* location and boundaries is helpful), SEC SIERRA COLLEGE BLVD & BRACE RD

(d) the scope of services desired for the Phase I ESA (including whether any parties to the *property* transaction may have a required standard scope of services or whether any considerations beyond the requirements of Practice E1527 are to be considered), STANDARD

(e) identification of all parties who will rely on the Phase I *report*, YES

(f) identification of the site contact and how the contact can be reached, YES.

(g) any special terms and conditions which must be agreed upon by the *environmental professional*, and NO

(h) any other knowledge or experience with the *property* that may be pertinent to the *environmental professional* (for example, copies of any available prior *environmental site assessment reports*, documents, correspondence, etc., concerning the *property* and its environmental condition).

The *USER* QUESTIONNAIRE was completed by:

Name MICHAEL OKUMA

Title DIR REAL ESTATE DEV

Firm COSTCO WHOLESALE

Address 9 CORP PARK

STE 230, IRVINE, CA

Phone Number (office) 714/978-5023

(cell)

User represents that to the best of the *user's* knowledge the above statements and facts are true and correct, and, to the best of the *user's* knowledge, no material facts have been suppressed or misstated.

User's Signature

Date 12/08/16

PHASE I

ENVIRONMENTAL SITE ASSESSMENT

LOOMIS PROPERTY

SIERRA COLLEGE BOULEVARD AND BRACE ROAD

PLACER COUNTY, CALIFORNIA

PREPARED BY:

SOIL SEARCH ENGINEERING
4088 BRIDGE STREET #9
FAIR OAKS, CALIFORNIA 95628
(916) 966-3902

February 25, 2005
Job Number 512E

Job Number 512E
February 25, 2005

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SOIL SEARCH ENGINEERING
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
4088 BRIDGE ST. #9, FAIR OAKS, CA 95628 (916)966-3902

Job No. 512E
February 25, 2005

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

INTRODUCTION

This report presents our findings from phase I environmental site assessment for the above subject property located at the south east corner of Sierra College Boulevard and Brace Road, Loomis, Placer County, California.

The primary objective of the Phase I Site Assessment, was to evaluate the property for evidence of potential soil and ground water contamination resulting from former site activities according to the following scope of work.

SCOPE OF WORK

The scope of work performed to develop the information contained in this phase I environmental site assessment, was defined pursuant to the American Society of Testing and Materials (ASTM) Standard E 1527-00, Standard Practice for Environmental Site Assessments. This Report presents all work performed by SSE to date with regard to this project. The scope of work includes the following:

A site reconnaissance of the property and surrounding areas to observe general area features and identify potential indications of usage, storage, handling and disposal of hazardous materials. This included a walk-through inspection of the subject property, and a drive-by survey of nearby properties. Personal and telephone interviews with representatives of various regulatory agencies as well as persons familiar with the site history.

A review of Federal, State, County and Local regulatory agencies' records concerning the site and contamination cases in the area to identify potential environmental hazards of the subject property, and off-site properties that might affect the subject property.

A review of the history of site usage to identify potential sources of hazardous materials on the subject property by obtaining and/or reviewing selected aerial photographs and/or other pertinent sources of information covering the property.

The principal findings are outlined throughout the body of this text and are summarized in the summary section of this report. In preparing this report, SSE has engaged the services of Environmental Data Resources, Inc., EDR, of Milford, Connecticut. The report, provided by EDR, is a radius search of government records which conforms to the ASTM standard for Phase I preliminary site assessments. Subsurface exploration or chemical screening of soil and groundwater beneath the site, is not within the scope of work in this study.

SITE DESCRIPTION

The site is irregular in shape and the general topography of the area is relatively flat terrain. At the time of our site observation, the site was covered with moderate growth of grass, weeds and a number of native trees. There were two residential structures, appeared to be occupied, at the approximate corner of Brace Road and Starlite Lane, north east part of the site. It is our understanding that the proposed project consists of a new subdivision for construction of one/two story wood frame single family residential structures and related improvements.

The property is approximately 18 acres in size, located at the south east corner of Sierra College Boulevard and Brace Road, Loomis, Placer County, California, as shown on Vicinity Map, Plate Number 1, Appendix A. The parcel map for the area, presented on Plates Number 2, shows the subject property and the neighboring sites. The property has Assessor's Parcel Numbers (APN) 045-042-011, 012, 023, 034, 035, 036 & 037.

Surrounding sites are vacant lots/residential structures on north and east and commercial structures/vacant lots, on south and west. The photographs of the area around the subject property are presented on Plates Number 3 through 6, Appendix A. We understand that the proposed development will consist of a new subdivision for construction of one/two story wood frame single family residential structures and related improvements.

REVIEW OF FEDERAL AND STATE REGULATORY AGENCY DATABASE SEARCHES

A search of available environmental records was conducted by Environmental Data Resources, Inc., EDR. The report meets the government records search requirements of ASTM Environmental Data Resources, Inc., EDR. The report, provided by EDR, meets the government records requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00 Search distances are per ASTM standard. Selected section of the report is presented in Appendix "B". The complete report will be kept on file and may be reviewed upon request. The report out-line is presented next.

Target Property Information

Address and Coordinates
USGS Topographic Map
Target property search results

Database With No Mapped Sites

No mapped sites were found in EDR's search of available ("reasonably ascertainable") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

Federal ASTM Standard
National Priority List
Proposed National Priority List Sites
Comprehensive Environmental Response, Compensation, and Liability Information System
CERCLIS No Further Remedial Action Planned, CERCLIS-NFRAP
Corrective Action Report
Resource Conservation and Recovery Act Information, RCRA-TSDF
Resource Conservation and Recovery Act Information, RCRA-LQG
Resource Conservation and Recovery Act Information, RCRA-SQG
Emergency Response Notification System

State ASTM Standard
Annual Workplan Sites
California Hazardous Material Incident Report System
Proposition 65 Records

Toxic Pits Cleanup Act Sites
Solid Waste Information System, SWF/LF
Waste Management Unit Database
Voluntary Cleanup Program Properties
Leaking Underground Storage Tanks on Indian Land
Underground Storage Tanks on Indian Land
Facility Inventory database

Federal ASTM Supplemental
Superfund (CERCLA) Consent Decrees
Records of Decision
National Priority List Deletions
Facility Index System/Facility Identification Initiative Program Summary Report
Hazardous Materials Information Reporting System
Material Licensing Tracking System
Mines Master Index File
Federal Superfund Liens
PCB Activity Database System
Uranium Mill Tailings Sites
Department of Defense Sites
Indian Reservations
Open Dump Inventory
Formerly Used Defense Sites
RCRA Administrative Action Tracking System
Toxic Chemical Release Inventory System
Toxic Substances Control Act
Section 7 Tracking Systems
FIFRA/TSCA Tracking System

State or Local ASTM Supplemental
Aboveground Petroleum Storage Tank Facilities
Cleaner facilities
Waste Discharge System
Site Mitigation and Brownfields Reuse Program Facility Sites with
Deed Restrictions Listing
School Property Evaluation Program

Unconfirmed Properties Referred to Another Agency
Emissions Inventory Data
No Further Action Determination
Properties Needing Further Evaluation
Statewide SLIC Cases
Facility and Manifest Data
Master List of Facilities

EDR Proprietary Historical Databases
Former Manufactured Gas (Coal Gas) Sites

Brownfields Databases
A listing of Brownfields Sites
Voluntary Cleanups Program Properties

Surrounding Sites: Search Results

Surrounding sites were identified. Unmappable (orphan) sites are not considered in the foregoing analysis.

State ASTM Standard
CAL-SITES
CORTESE
LUST
BEP
UST
HIST UST

Summary of the results, Overview Map, Detail Map, Map finding Summary, Orphan Summary, Physical Setting Source Addendum, Physical Setting Source Summary, Physical Setting Source Map and Physical Setting Source Records Searched are presented in Appendix "B". Additional information will be presented upon request.

REVIEW OF COUNTY AND LOCAL REGULATORY AGENCY DATABASE SEARCHES

Placer County Environmental Management Department

Inquiries were made with the Placer County Environmental Management Department, General Information-Public File Review-Enforcement-site, Assessment & Mitigation, in an attempt to determine if there are any files present at that agency which indicate that the subject property is on the County Toxic, Hazardous Materials and/or Complaint and Incident Response Log list. According to our conversation with the office of Brenda Noxon on February 28, March 1 and 2, 2005, the subject property, located at Sierra College Boulevard and Brace Road, Loomis, Placer County, California, does not appear on the Placer County Toxic, Hazardous Material, and/or Complaint and Incident Response Log lists.

Fire Department

Inquiries were made with the Fire Department at Roseville, General Information-Public File Review-Enforcement-site, in an attempt to determine if there are any files present at that agency which indicate that the subject property is on the city, Hazardous Materials and/or Complaint and Incident Response Log list. According to our conversation with Steve Anderson on February 28, 2005, the subject property does not appear on the Roseville Hazardous Material, and/or Complaint and Incident Response Log lists.

Placer County, Public Works Agency

The property is approximately 18 acres in size, located at the south east corner of Sierra College Boulevard and Brace Road, Loomis, Placer County, California. The parcel map for the area, presented on Plates Number 2, shows the subject property and the neighboring sites. The property has Assessor's Parcel Numbers APN 045-042-011, 012, 023, 034, 035, 036 & 037. We understand that the proposed development will consist of a new subdivision for construction of one/two story wood frame single family residential structures and related improvements. Inquiries should be made with the Placer County, Public Works Agency, Planning Department by the project civil engineer for other related information.

Placer County Agricultural Commissioner's Office

Inquiries were made with the Placer County Agricultural Commissioner's Office in an effort to determine whether the subject property had been used in the past for agricultural purposes, and whether agricultural chemicals had been used on the subject property. According to our phone conversation on February 28, 2005, with Josh Huntsinger at the Agricultural Commissioner's Office, there is no records of the agricultural history on the subject property or of agricultural chemical use on the subject property at this time. We were also informed that this office normally keeps the records for two years only.

Air Pollution Control District

The Sacramento Metropolitan Air Quality Management District was contacted by telephone, in an effort to determine whether the air in the study area is in attainment status according to State and Federal standards, and to determine whether any Air Standards Violations have been issued to the subject property or to sites within a one-half (½) mile radius of the subject property. According to our conversation with the office of Air Quality Management District, on February 28, 2004, the information will be released upon written request. Additional information will be presented as an addendum, upon request.

REVIEW OF PROPERTY - PAST OWNERSHIP AND USE

Our office had conversations with Tina Davis, escrow title officer of Fidelity National Title Company of Redwood City, Dennis Wagstaffe of Wagstaffe & Wagstaff , Redwood City, owner representative, and Dunmore Communities of Roseville, California, in order to attempt to determine past history of the ownership and use of the above subject property. A preliminary title report of the above subject project, dated January 12, 2005, was prepared by Fidelity National Title Company.

Donald B. Tanklage and Carole F. Tanklage Foundation, a nonprofit public benefit corporation is the present owner of the property. It is our understanding that Donald and Carole Tanklage own the property for more than 25 yeas and Dunmore is in agreement to buy the property. The property is approximately 18 acres in size located at the south east corner of Sierra College Boulevard and Brace Road, Loomis, Placer County, California. The property has Assessor's Parcel Numbers APN 045-042-011, 012, 023, 034, 035, 036 & 037. At the time of our site observation, there were two residential structures on the site. Surrounding sites are vacant lots/residential structures on north and east and commercial structures/vacant lots, on south and west. We understand that the proposed

development will consist of a new subdivision for construction of one/two story wood frame single family residential structures and related improvements.

AERIAL PHOTOGRAPH REVIEW

The aerial photographs is a screening tool designed to assist professionals in evaluating potential liability on a target property resulting from the past activities. ASTM E 1527-00, Section 7.3 on Historical Use Information, identifies the prior use requirements for a Phase I environmental site assessment. Aerial photographs, taken from available recent, back to the property's obvious first developed use or back to 1940, whichever is earlier, will be reviewed when available.

The aerial photographs taken in 1952, 1962, 1984, 1993 and 1998, depicts the subject property, were reviewed. The aerial photographs taken in 1952, depicts the subject property as a vacant lot with no structure on the site and no indication of Interstate Highway 80. The aerial photographs taken in 1962, depicts the subject property as a vacant lot with no structure on the site. Interstate Highway 80 and the Sierra College Intersection were in place. The aerial photographs taken in 1993, depicts the neighboring residential structures on the north and the new residential subdivision on the east side of the subject property. The aerial photo taken in 1952, 1962, 1984, 1993 and 1998 are presented in Appendix "A".

GEOLOGIC AND HYDRO GEOLOGIC FEATURES

The area of the subject site lies in the western margin of Sierra Nevada province. The Sierra Nevada extends about 400 miles, terminating in the north at Lassen Peak in the Cascade Range province. The rock and structural patterns of the Sierra disappear beneath the lavas of the Cascades and the volcanic and sedimentary cover of the northern Sacramento Valley. To the south, Sierra grades into the Tehachapi Mountains, which enclosed the southern end of the Great Valley. The Sierra basement terminates near the western margin of the Great Valley, presumably in contact with the Franciscan formation. The Sierra is from 40 to 100 miles wide. Its elevations vary from 400 feet at the Great Valley boundary to summits of more than 14,000 feet adjacent to the Basin Ranges. (Norris & Webb, 1976).

The foothills and mountains of the Sierra Nevada and the Sacramento Valley are the result of a complex geologic history, some aspects of which are unclear even now (Butte County Planning Department, L. Painter, 10-94). The old bedrock, or metamorphic base rock, series of the Sierra

Nevada has been subjected to an intense deformation resulting in dynamically metamorphosed rocks. Intense folding and faulting have produced an area of steep, commonly eastwardly dipping, northwesterly striking bedrock series through the center of the Sierra Nevada. This bedrock series is bound on the east and west by zones of active and potentially active faults.

In the eastern portion, granite has intruded into the older metamorphic bedrock. These intrusives may extend to the west under the metamorphics at the relatively shallow depth. Contact between the granitic intrusives and metamorphics is in many cases marked by seismic evidence which indicates faulting may be continuing today.

On the west, the sediment of the Sacramento Valley overlaps the rocks of the Sierra Nevada foothills. These sediments, for the most part, are relatively flat and dip gently west to southwest with only minor faulting and folding parallel to the structural trend of the valley and the Sierra Nevada range.

The area containing the subject site is mapped by Charles W. Jennings, 1977, fifth printing 2000, Geologic map of California, as Mesozoic granite, quartz monzonite, granodiorite, and quartz diorite.

SITE OBSERVATION

A visual reconnaissance of the subject property was conducted, on February 4, 2005, prior to the compilation of this report. The subject property is approximately 18 acres in size, located at the south east corner of Sierra College Boulevard and Brace Road, Loomis, Placer County, California.

The site is irregular in shape and the general topography of the area is flat terrain. At the time of our site observation, there were two residential structures, appeared to be occupied, at the approximate corner of Brace Road and Starlite Lane, north east part of the site. The site was covered with moderate growth of grass. weeds and a number of native trees.

Surrounding sites are vacant lots/residential structures on north and east and commercial structures/vacant lots, on south and west. The photographs of the area around the subject property are presented on Plates Number 3 through 6, Appendix A. We understand that the proposed development will consist of a new subdivision for construction of one/two story wood frame single family residential structures and related improvements.

SUMMARY

This Environmental Site Assessment, Phase I, Report is prepared pursuant to the scope of work and limitations specified within this document.

The subject property is approximately 18 acres in size, located at the south east corner of Sierra College Boulevard and Brace Road, Loomis, Placer County, California. We understand that the proposed development will consist of a new subdivision for construction of one/two story wood frame single family residential structures and related improvements.

As reported above, our office conducted a field reconnaissance of the site and surrounding area, a review of the regulatory agencies' records as well as interviewed regulatory officials and other individuals to obtain information concerning the known and potential use, storage, disposal and/release of hazardous materials at the subject property. Chemical analysis of soil and groundwater samples to quantify levels of contamination is not within the scope of work to develop a Phase I, Environmental Site Assessment report . No evidence of recognized environmental conditions in connection with the subject property was found at this time.

Executive Summary, Overview Map, Detail Map, Map finding Summary, Physical Setting Source Addendum, Physical Setting Source Summary, Physical Setting Source Map Findings and Physical Setting Source Records Searched are presented in the Executive Summary, Appendix B. Additional information will be presented upon request.

CONCLUSIONS AND RECOMMENDATIONS

This assessment has revealed no evidence of recognized environmental conditions in connection with the subject property at this time. However, should there be a need to conduct an investigation into a specific question not addressed in this report, contact our office immediately regarding your concerns.

Any existing septic tanks and/or water/dry wells, if any, should be abandoned/removed pursuant to the Environmental Management Requirements. We recommend that our firm be retained to perform observations during the demolition of the structures as well as the cleaning process to verify that the recommendations have been properly interpreted and implemented. Additional recommendations may be presented during the demolition and cleaning process.

LIMITATIONS

This report was compiled as a Phase I, Environmental Site Assessment for the subject project. In preparing this report Soil Search Engineering, SSE, has engaged the services of Environmental Data Resources, Inc., EDR, of Milford Connecticut.

This report contains information and data provided to Soil Search Engineering, by several sources. SSE in no way warrants the accuracy or completeness of the information provided to this investigation by those sources. It should be noted that when an assessment is completed without adequate subsurface exploration or chemical screening of soil and groundwater beneath the site, as in this study, no statement of scientific certainty can be made regarding latent subsurface conditions which may be the result of on-site or off-site sources.

This report contains information obtained from a variety of public and other sources. No warranty expressed or implied, is made whatsoever in connection with this report. SSE specifically disclaims the making of any such warranties, including without limitation, merchantability or fitness for a particular use or purpose.

The findings and conclusions of this report are not scientific certainties, but rather, probabilities based on professional judgement concerning the significance of the data gathered during the course of this investigation. SSE is not able to represent that the site or adjoining land contains no hazardous waste, oil, or other latent condition beyond that detected or observed by SSE during the Phase I, Environmental Site Assessment.

The possibility always exists for contaminants to migrate through surface water, air, or groundwater. An investigation to determine whether or not contaminants are present in the surface and subsurface soil is not within the scope of work required to produce the "Phase I, Environmental Site Assessment".

Chemical analysis of soil and groundwater samples to quantify levels of contamination is also not within the scope of work required to develop a "Phase I, Environmental Site Assessment". Our office has not been provided with specific criteria for the development of this report other than a request to evaluate the property in question for possible problems related to toxic or hazardous agents, nor have we been directed to address any specific questions concerning the site.

Job No. 512E
February 25, 2005

This report is the property of SSE and prepared exclusively for the specified client and project to develop environmental data to aid in the evaluation of the subject project. This report shall not be reproduced or used for any other purposes without express written consent of our firm. This report is applicable only to the investigated site and should not be utilized for any other site. Should there be a need to conduct an investigation into a specific question not addressed in this report, contact our office immediately regarding your concerns.

SOIL SEARCH ENGINEERING

A-Badie

Ahmad Badie, Ph.D., President
REA II-20168, RCE #37861

REGISTERED PROFESSIONAL ENGINEER
AHMAD BADIE
No. C037861
Exp 3/31/07
CIVIL
STATE OF CALIFORNIA

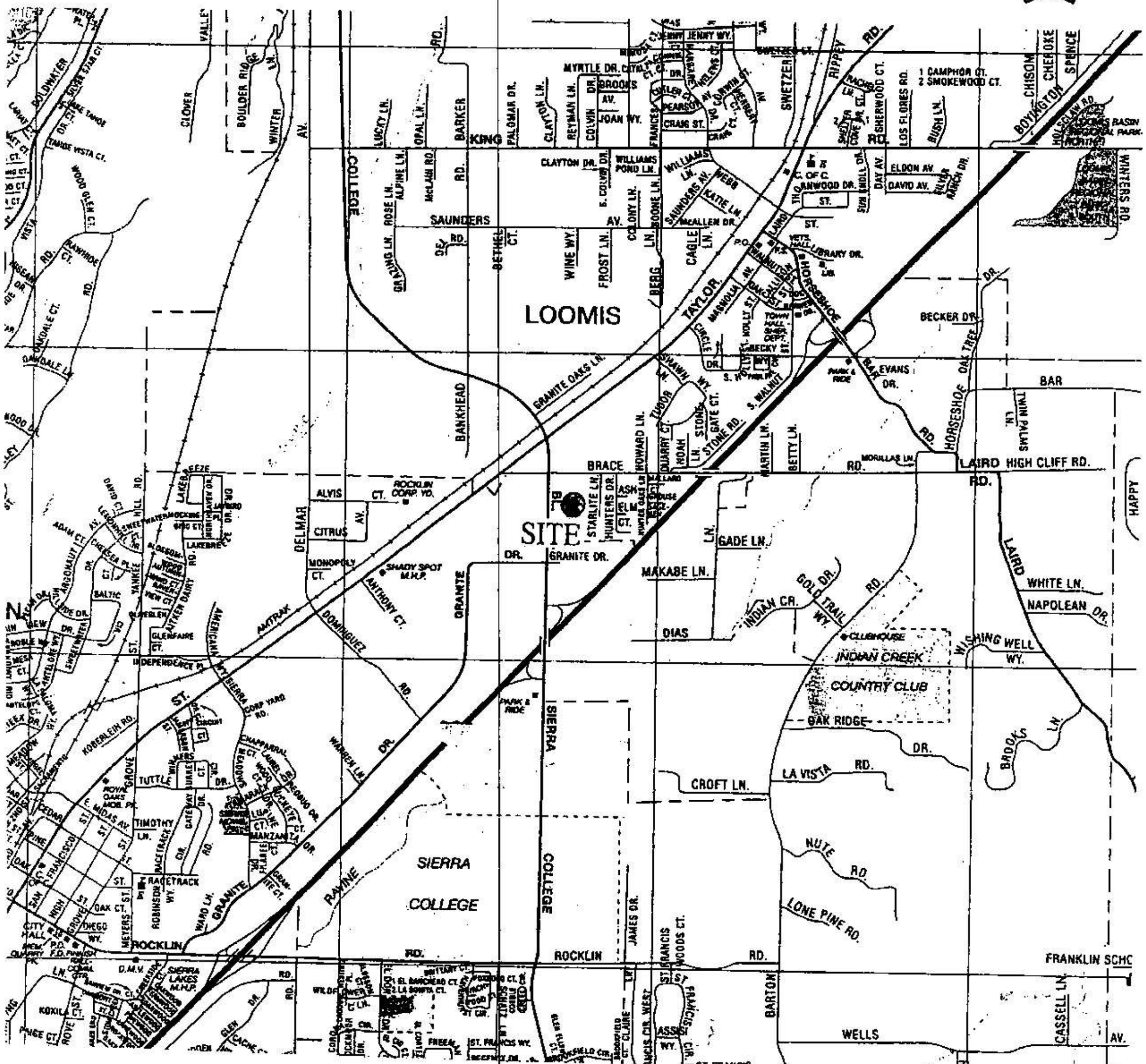
512E.ph1

APPENDIX A

VICINITY MAP
PARCEL MAP
PHOTOGRAPHS
AERIAL PHOTOGRAPHS

SITE

NORTH

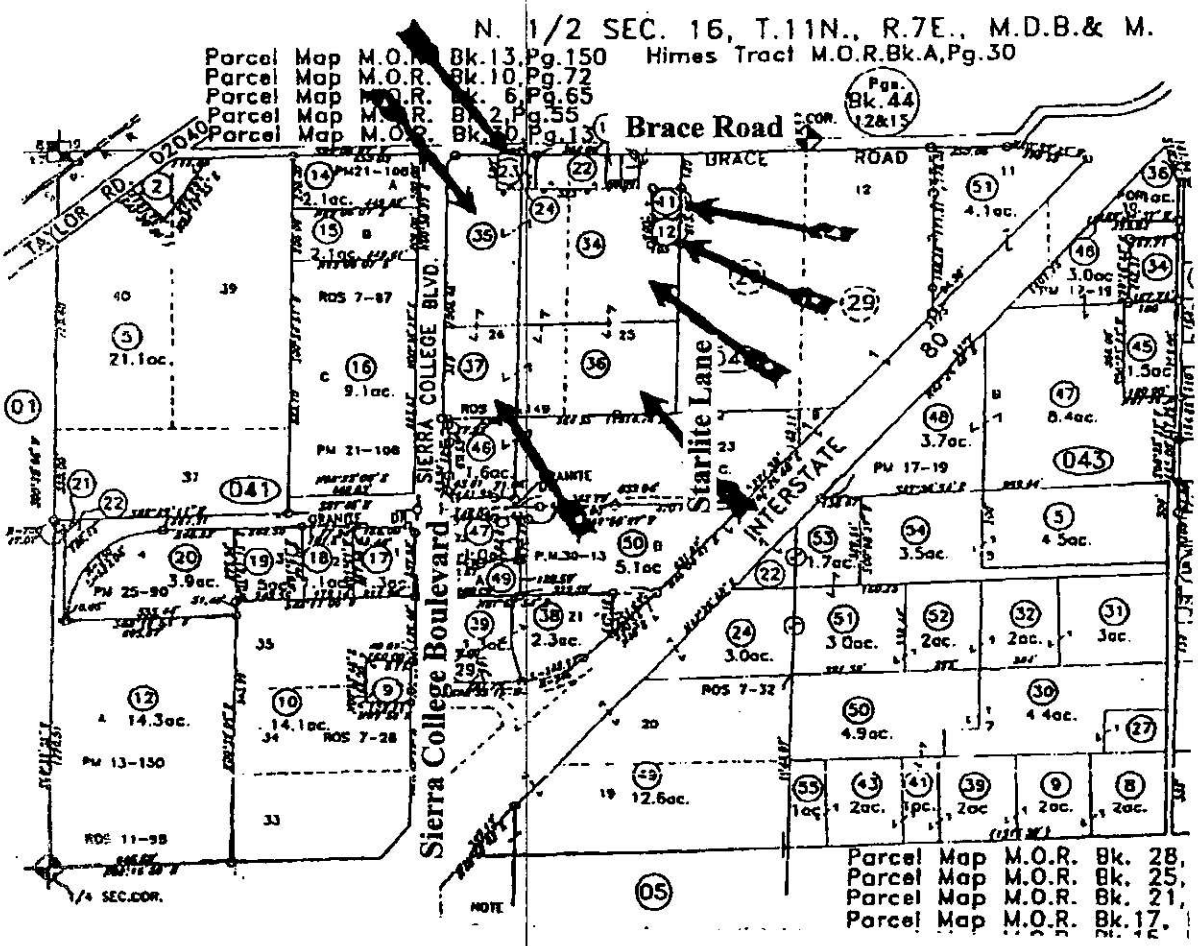


VICINITY MAP

JOB NUMBER 512E	FEBRUARY 25, 2005	VICINITY MAP	PLATE No. 1

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

SSE 4088 Bridge Street #9, Fair Oaks, California 95628 Phone (916) 966-3902



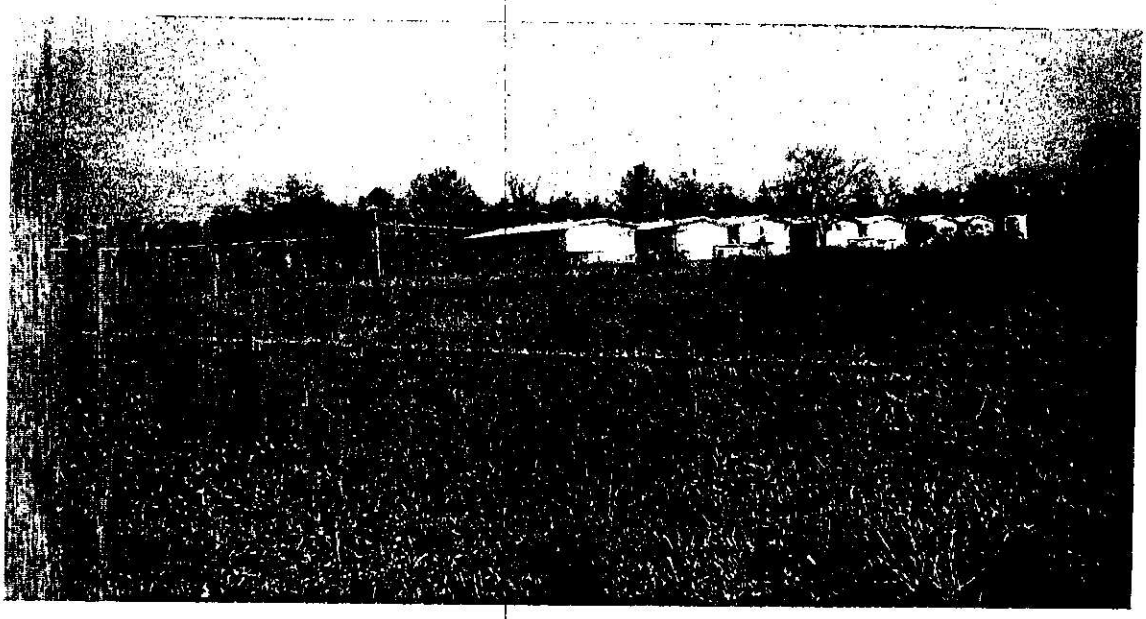
PARCEL MAP

JOB NUMBER 512E	FEBRUARY 25, 2005	PARCEL MAP	PLATE No. 2

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

SSE 4088 Bridge Street #9, Fair Oaks, California 95628 Phone (916) 966-3902

NORTH VIEW



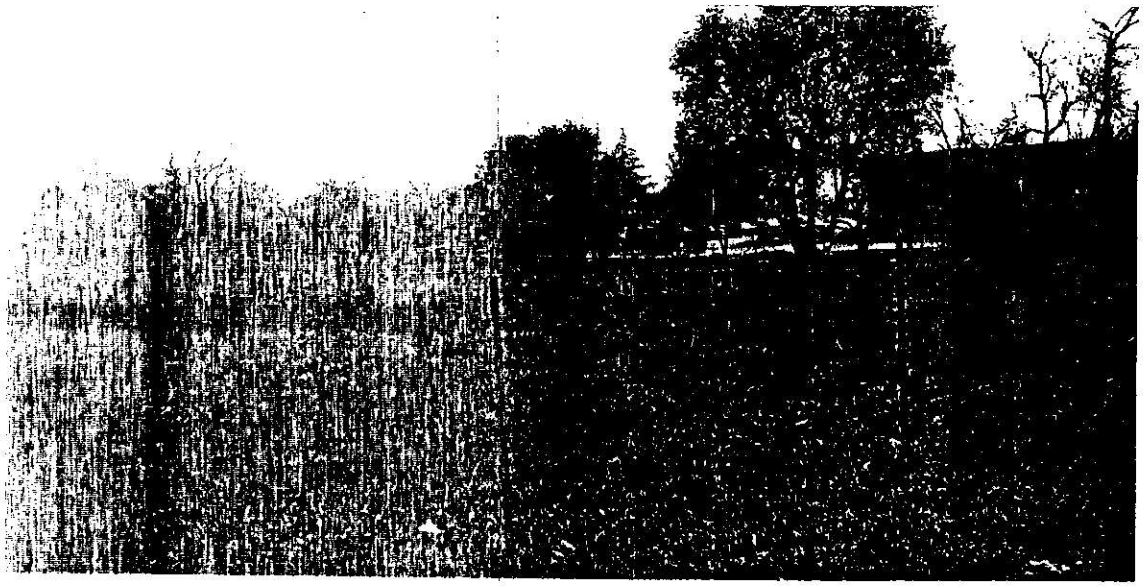
PHOTOGRAPH

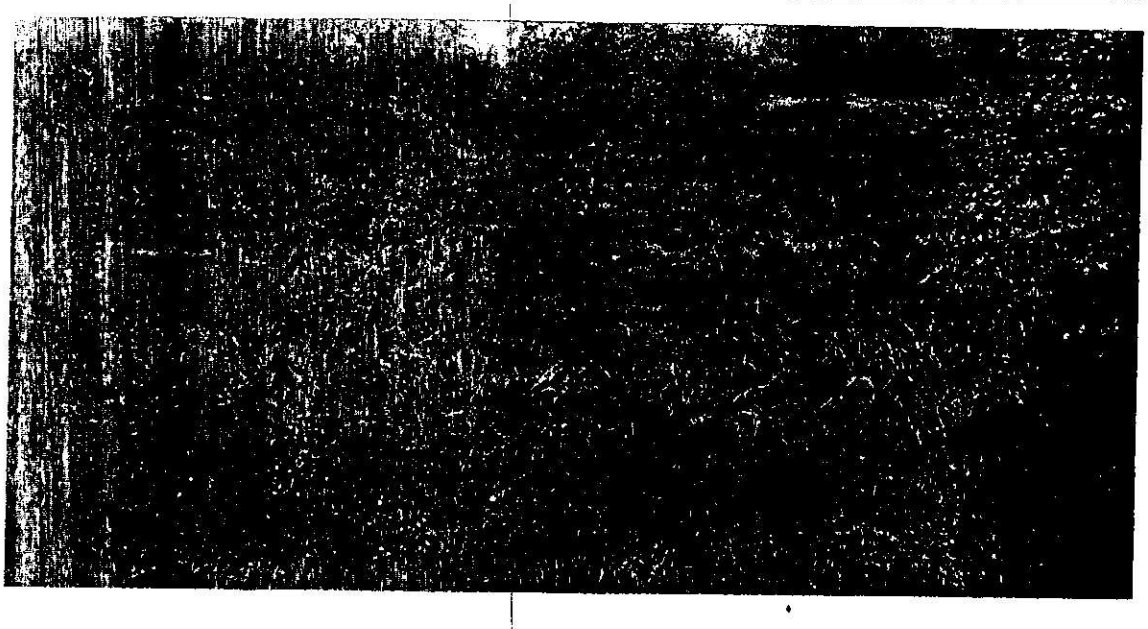
JOB NUMBER 512E	FEBRUARY 25, 2005	PHOTOGRAPH	PLATE No. 3

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

SSE 4088 Bridge Street #9, Fair Oaks, California 95628 Phone (916) 966-3902

SOUTH VIEW





PHOTOGRAPH

JOB NUMBER 512E	FEBRUARY 25, 2005	PHOTOGRAPH	PLATE No. 4

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

SSE 4088 Bridge Street #9, Fair Oaks, California 95628 Phone (916) 966-3902

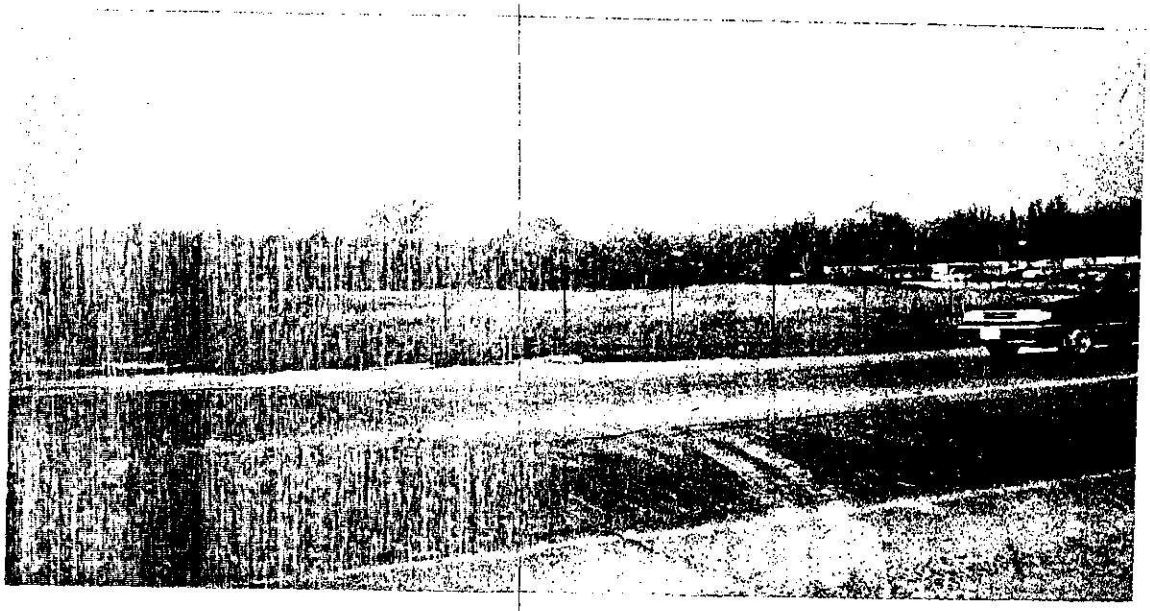
PHOTOGRAPH

JOB NUMBER 512E	FEBRUARY 25, 2005 PHOTOGRAPH	PLATE No. 5

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

SSE 4088 Bridge Street #9, Fair Oaks, California 95628 Phone (916) 966-3902

WEST VIEW



PHOTOGRAPH

JOB NUMBER 512E	FEBRUARY 25, 2005	PHOTOGRAPH	PLATE No. 6

LOOMIS PROPERTY
SIERRA COLLEGE BOULEVARD AND BRACE ROAD
PLACER COUNTY, CALIFORNIA

SSE 4088 Bridge Street #9, Fair Oaks, California 95628 Phone (916) 966-3902

The EDR-Aerial Photography Print Service

Loomis Property
Sierra College Blvd, Brace Rd
Loomis, CA 95650

March 1, 2005

Inquiry Number: 1368063-4

EDR® Environmental Data Resources Inc

The Standard In Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802

Environmental Data Resources, Inc.
Aerial Photography Print Service

Environmental Data Resources, Inc.'s (EDR) Aerial Photography Print Service is a screening tool designed to assist professionals in evaluating potential liability on a target property resulting from past activities. ASTM E 1527-00, Section 7.3 on Historical Use Information, identifies the prior use requirements for a Phase I environmental site assessment. The ASTM standard requires a review of *reasonably ascertainable standard historical sources. Reasonably ascertainable means information that is publicly available, obtainable from a source with reasonable time and cost constraints, and practically reviewable.*

To meet the prior use requirements of ASTM E 1527-00, Section 7.3.4, the following *standard historical sources* may be used: aerial photographs, fire insurance maps, property tax files, land title records (although these cannot be the sole historical source consulted), topographic maps, city directories, building department records, or zoning/land use records. ASTM E 1527-00 requires *"All obvious uses of the property shall be identified from the present, back to the property's obvious first developed use, or back to 1940, whichever is earlier. This task requires reviewing only as many of the standard historical sources as are necessary, and that are reasonably ascertainable and likely to be useful."* (ASTM E 1527-00, Section 7.3.2, page 12.)

Aerial Photographs

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Aerial photographs are a valuable historical resource for documenting past land use and can be particularly helpful when other historical sources (such as city directories or fire insurance maps) are not reasonably ascertainable. The EDR Aerial Photograph Print Service includes a search of local aerial photograph collections flown by public and private agencies. EDR's professional field-based researchers provide digitally reproduced historical aerial photographs at ten year intervals.

Please call Environmental Data Resources, Inc. Nationwide Customer Service at
1-800-352-0050 (8am-8pm ET)
with questions or comments about your report.
Thank you for your business!

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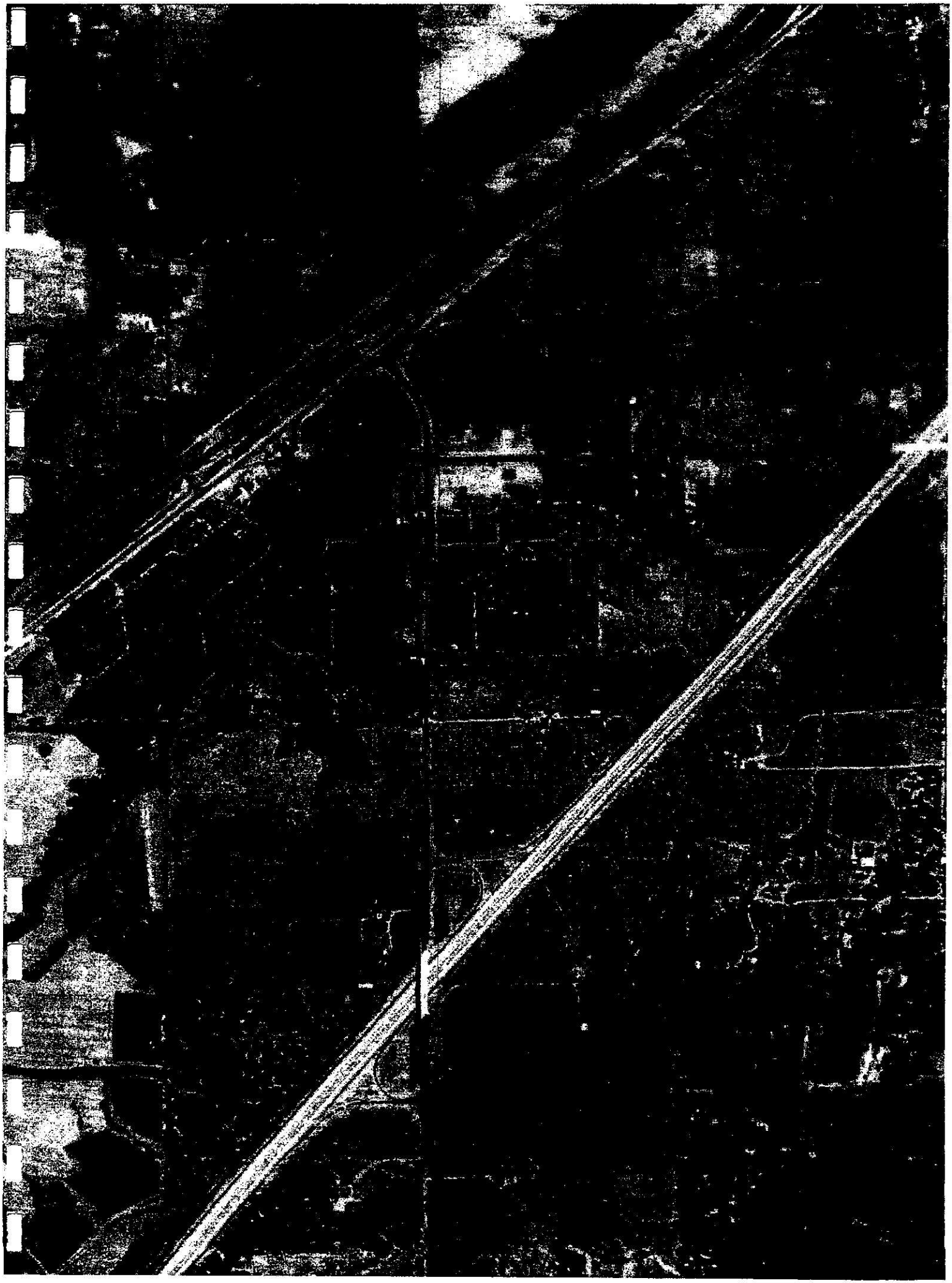

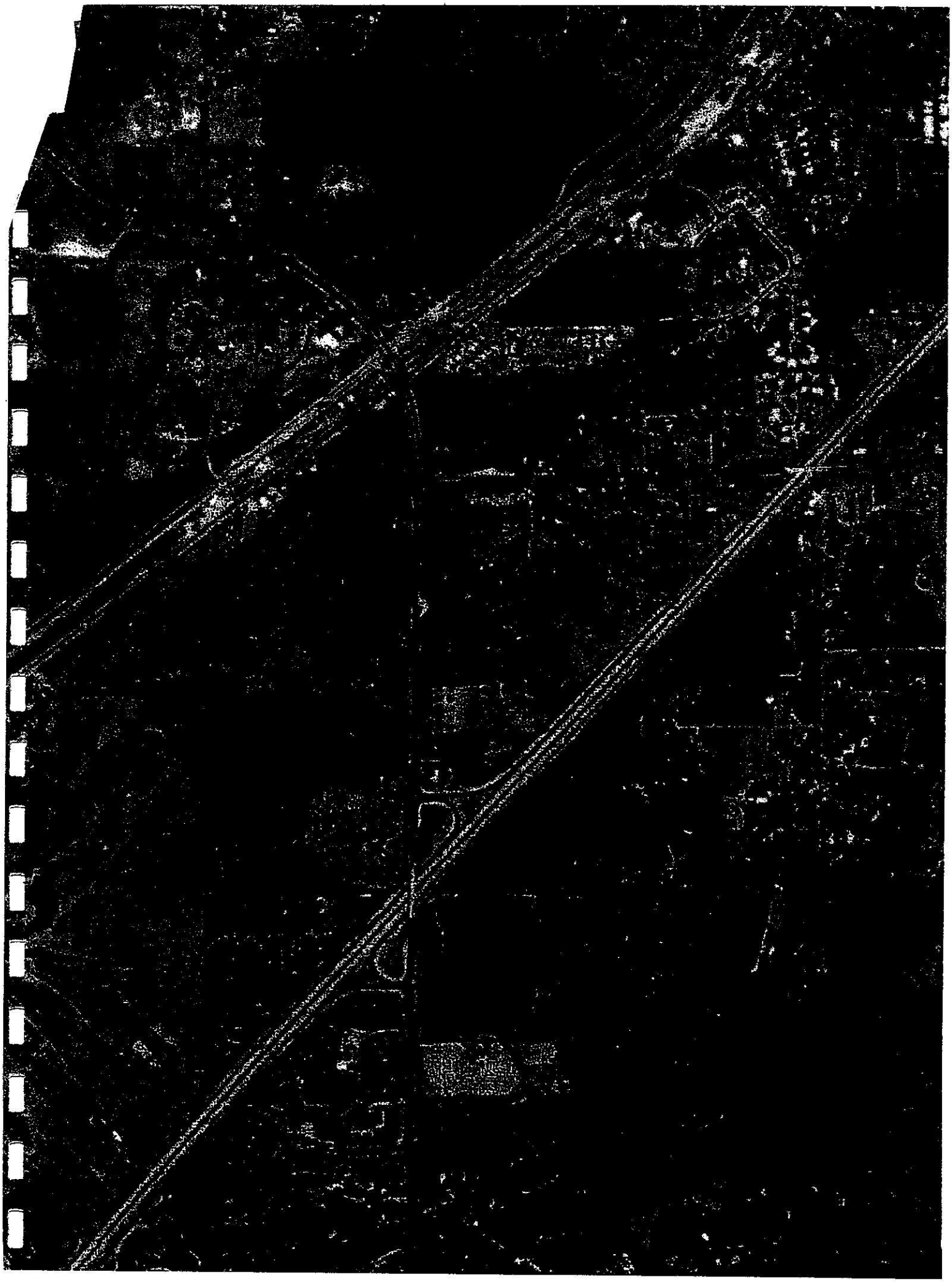

APPENDIX B

ENVIRONMENTAL RISK MANAGEMENT
EXECUTIVE SUMMARY
OVERVIEW MAP
DETAIL MAP
MAP FINDING SUMMARY
EPA WASTE CODES ADDENDUM
PHYSICAL SETTING SOURCE ADDENDUM
PHYSICAL SETTING SOURCE SUMMARY
PHYSICAL SETTING SOURCE MAP
PHYSICAL SETTING SOURCE RECORD SEARCHED

The EDR Radius Map
with GeoCheck®

Loomis Property
Sierra College Blvd, Brace Rd
Loomis, CA 95650

Inquiry Number: 1368052.2s

February 25, 2005

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The Standard in Environmental Risk Management Information

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FORM-WL

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Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	6
Orphan Summary	16
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting Source Map	A-7
Physical Setting Source Map Findings	A-8
Physical Setting Source Records Searched	A-14

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with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

SIERRA COLLEGE BLVD, BRACE RD
LOOMIS, CA 95650

COORDINATES

Latitude (North):	38.808800 - 38' 48' 31.7"
Longitude (West):	121.204300 - 121' 12' 15.5"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	655919.9
UTM Y (Meters):	4296883.5
Elevation:	334 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	38121-G2 ROCKLIN, CA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
CORRACTS..... Corrective Action Report
RCRA-TSDF..... Resource Conservation and Recovery Act Information
RCRA-LQG..... Resource Conservation and Recovery Act Information
RCRA-SQG..... Resource Conservation and Recovery Act Information
ERNS..... Emergency Response Notification System

STATE ASTM STANDARD

AWP..... Annual Workplan Sites

CHMIRS..... California Hazardous Material Incident Report System
Notify 65..... Proposition 65 Records
Toxic Pits..... Toxic Pits Cleanup Act Sites
SWF/LF..... Solid Waste Information System
WMUDS/SWAT..... Waste Management Unit Database
VCP..... Voluntary Cleanup Program Properties
INDIAN UST..... Underground Storage Tanks on Indian Land
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land
CA FID UST..... Facility Inventory Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision
Delisted NPL..... National Priority List Deletions
FINDS..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
PADS..... PCB Activity Database System
UMTRA..... Uranium Mill Tailings Sites
ODL..... Open Dump Inventory
FUDS..... Formerly Used Defense Sites
DOD..... Department of Defense Sites
INDIAN RESERV..... Indian Reservations
RAATS..... RCRA Administrative Action Tracking System
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
SSTS..... Section 7 Tracking Systems
FTTS INSP..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST..... Aboveground Petroleum Storage Tank Facilities
CLEANERS..... Cleaner Facilities
CA WDS..... Waste Discharge System
DEED..... Deed Restriction Listing
SCH..... School Property Evaluation Program
REF..... Unconfirmed Properties Referred to Another Agency
EML..... Emissions Inventory Data
NFA..... No Further Action Determination
NFE..... Properties Needing Further Evaluation
CA SLIC..... Statewide SLIC Cases
HAZNET..... Facility and Manifest Data
CA PLACER CO. MS..... Master List of Facilities

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas..... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS..... A Listing of Brownfields Sites

VCP..... Voluntary Cleanup Program Properties

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STATE ASTM STANDARD

CAL-SITES: Formerly known as ASPIS, this database contains both known and potential hazardous substance sites. The source is the California Department of Toxic Substance Control.

A review of the Cal-Sites list, as provided by EDR, has revealed that there is 1 Cal-Sites site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
FOREST PRODUCTS MANUFACTURING,	ANTHONY COURT	1/2 - 1 WSW	10	14

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, has revealed that there are 3 Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON #9-6705	***4365 SIERRA COLLEGE BLV***	***1/8 - 1/4SSW***	***6***	***10***
SS #6008 (FORMER UNOCAL)	***4390 SIERRA COLLEGE***	***1/4 - 1/2SSW***	***A9***	***13***

Lower Elevation	Address	Dist / Dir	Map ID	Page
SHAMROCK PUMP & EQUIPMENT	4175 TAYLOR	1/8 - 1/4WNW	7	11

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 01/10/2005 has revealed that there are 4

LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
7-ELEVEN INC.	*4281 SIERRA COLLEGE BLV*	*1/8 - 1/4SSW*	*2*	*6*
CHEVRON #9-6705	*4365 SIERRA COLLEGE BLV*	*1/8 - 1/4SSW*	*6*	*10*
SS #6008 (FORMER UNOCAL)	4390 SIERRA COLLEGE BLV	1/4 - 1/2SSW	A8	12

Lower Elevation	Address	Dist / Dir	Map ID	Page
SHAMROCK PUMP & EQUIPMENT	3985 TAYLOR RD (AKA:	1/8 - 1/4NW	5	9

BEP: Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

A review of the CA BOND EXP. PLAN list, as provided by EDR, has revealed that there is 1 CA BOND EXP. PLAN site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
FOREST PRODUCTS MFG. CO	*4315 DOMINGUEZ ROAD*	*1/2 - 1 SW*	*11*	*14*

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 01/10/2005 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CHEVRON-ROCKLIN	4211 SIERRA COLLEGE BLV	1/8 - 1/4SSW	1	6

HIST UST: Historical UST Registered Database.

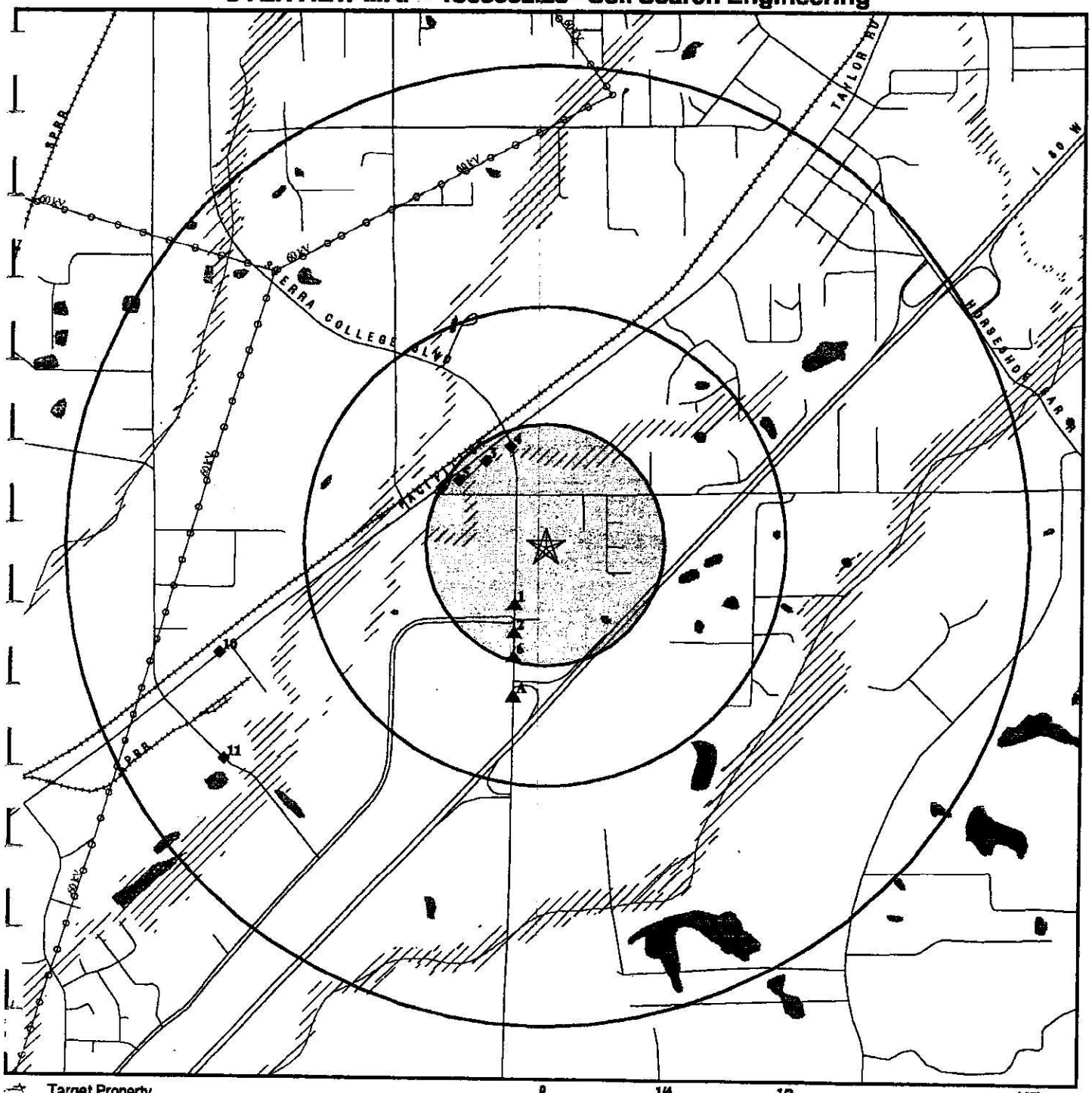
A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 HIST UST sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
96705	4365 SIERRA COLLEGE BLV	1/8 - 1/4NW	3	8
SAMUEL E. ROSE & BETTY A. ROSE	3921 SIERRA COLLEGE BLV	1/8 - 1/4NNW	4	9

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
FORMICA CORP	FINDS, LUST, CHMIRS, Cortese, RCRA-LQG, RCRA-TSDF, CORRACTS, CERC-NFRAP, CA WDS, HIST UST, EMI
SOUTHERN PACIFIC (ROUNDHOUSE)	CERC-NFRAP
ROCKLIN DUMP	CERC-NFRAP
LOOMIS SANITARY LANDFILL	SWF/LF
U.S. RENTALS SERVICE, #29	UST
LOOMIS HILL ESTATES	VCP
SIERRA STATION #12	HIST UST
CHEVRON STATION NO 205777	RCRA-SQG, FINDS
LOOMIS SANITARY LANDFILL	FINDS
LOOMIS LANDFILL	CA SLIC
LOOMIS SOLID WASTE DISP SITE	CA WDS
LOOMIS LANDFILL	CA WDS
ROCK CREEK AKA: SUNWEST #1	SCH
LOOMIS, TOWN OF, CORP. YARD	CA PLACER CO. MS
WORLDCOM - LOOMIS SITE	CA PLACER CO. MS
PCWA - LOOMIS	CA PLACER CO. MS

OVERVIEW MAP - 1368052.2s - Soil Search Engineering



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Coal Gasification Sites

National Priority List Sites

Landfill Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines

100-year flood zone

500-year flood zone

Federal Wetlands

Areas of Concern

N

TARGET PROPERTY:	Loomis Property	CUSTOMER:	Soil Search Engineering
ADDRESS:	Sierra College Blvd, Brace Rd	CONTACT:	Ahmad Badie
CITY/STATE/ZIP:	Loomis CA 95650	INQUIRY #:	1368052.2s
LAT/LONG:	38.8088 / 121.2043	DATE:	February 25, 2005 2:51 pm

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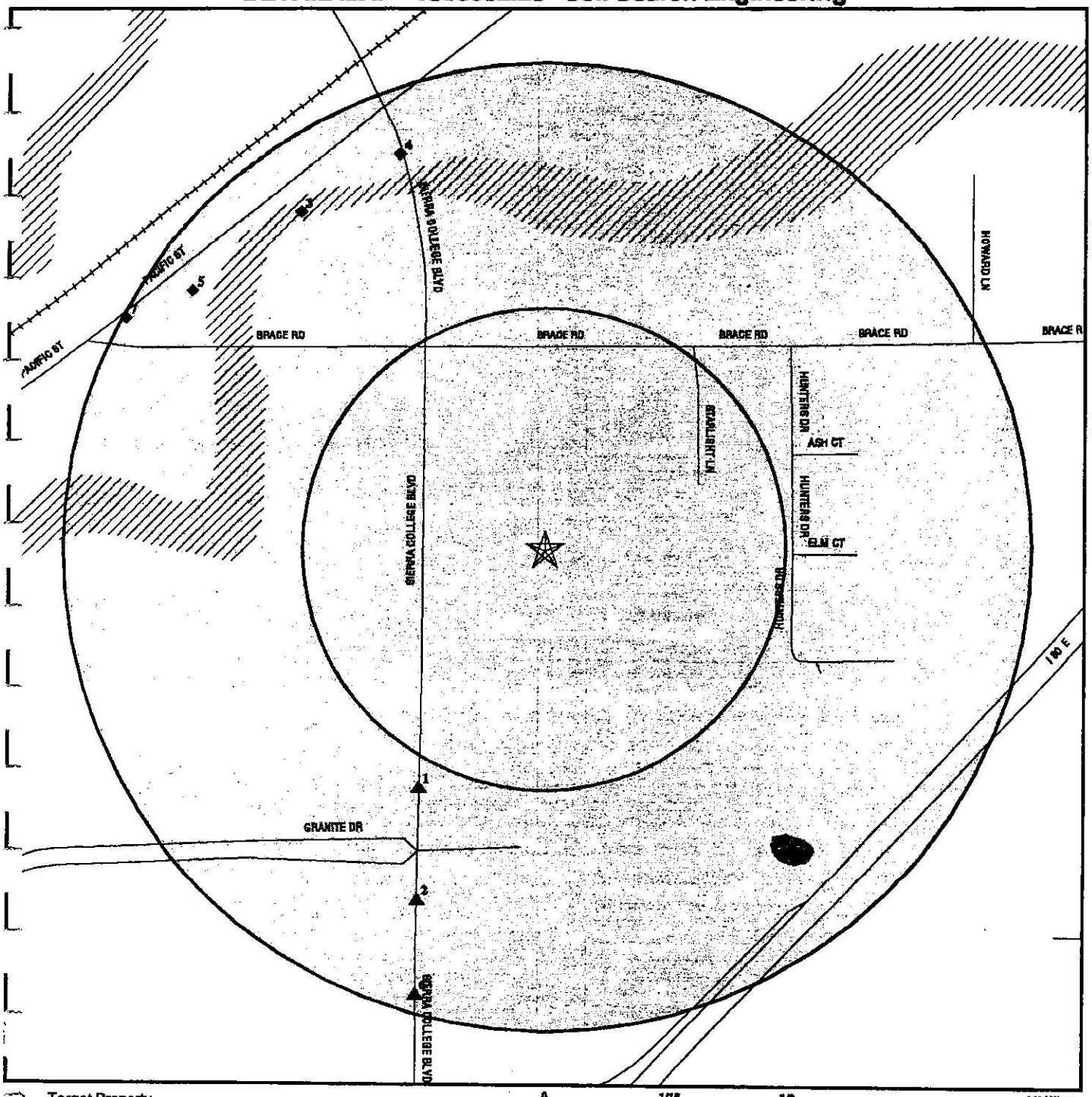
DETAIL MAP - 1368052.2s - Soil Search Engineering



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands
- Areas of Concern

TARGET PROPERTY:	Loomis Property	CUSTOMER:	Soil Search Engineering
ADDRESS:	Sierra College Blvd, Brace Rd	CONTACT:	Ahmad Badie
CITY/STATE/ZIP:	Loomis CA 95650	INQUIRY #:	1368052.2s
LAT/LONG:	38.8088 / 121.2043	DATE:	February 25, 2005 2:51 pm

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MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		0.500	0	0	0	NR	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
STATE ASTM STANDARD								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		1.000	0	0	0	1	NR	1
CHMIRS		TP	NR	NR	NR	NR	NR	0
Cortese		0.500	0	2	1	NR	NR	3
Notify 65		1.000	0	0	0	0	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
LUST		0.500	0	3	1	NR	NR	4
CA Bond Exp. Plan		1.000	0	0	0	1	NR	1
UST		0.250	0	1	NR	NR	NR	1
VCP		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
CA FID UST		0.250	0	0	NR	NR	NR	0
HIST UST		0.250	0	2	NR	NR	NR	2
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
FUDS		1.000	0	0	0	0	NR	0
DOD		1.000	0	0	0	0	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TSCA		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
AST		TP	NR	NR	NR	NR	NR	0
CLEANERS		0.250	0	0	NR	NR	NR	0
CA WDS		TP	NR	NR	NR	NR	NR	0
DEED		TP	NR	NR	NR	NR	NR	0
SCH		0.250	0	0	NR	NR	NR	0
REF		0.250	0	0	NR	NR	NR	0
EMI		TP	NR	NR	NR	NR	NR	0
NFA		0.250	0	0	NR	NR	NR	0
NFE		0.250	0	0	NR	NR	NR	0
SLIC		0.500	0	0	0	NR	NR	0
HAZNET		TP	NR	NR	NR	NR	NR	0
PLACER CO. MS		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.000	0	0	0	0	NR	0
BROWNFIELDS DATABASES								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

FOREST PRODUCTS MFG. CO (Continued) **S100833489**

Project Revenue Source Desc : This site is projected to be remediated by the responsible parties with reimbursement to DHS for its oversight. If the RPs are unable to fund site investigation and cleanup, another source of funds will need to be identified.

Responsible Party : BACKLOG SITE CLEANUP PLANNING REPORT

CA STATE SLIC :

Global Id :	SLT5S1023143
Region :	STATE
Assigned Name :	SLICSITE
Lead Agency Contact :	CORI CONDON
Lead Agency :	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number :	SLT5S102
Responsible Party :	GARY COLLEDGE
Recent Dtw :	Not reported
Substance Released :	VOC, 12035

EMISSIONS :

Facility ID :	70
Air District Code :	PLA
SIC Code :	2431
Total Priority Score :	6
Health Risk Assessment :	Not reported
Non-cancer Chronic Haz Index :	Not reported
Non-cancer Acute Haz Index :	Not reported
Air Basin :	SV
Air District Name :	PLACER COUNTY APCD
Community Health Air Pollution Info System :	Y
Consolidated Emission Reporting Rule :	Not reported
County Code :	31
County ID :	31

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
LOOMIS	S105255214	LOOMIS SOLID WASTE DISP SITE	END OF WINTERS RD / KING RD	95650	CA WDS
LOOMIS	S106104230	LOOMIS LANDFILL	KING RD	95650	CA WDS
LOOMIS	S105838287	LOOMIS HILL ESTATES	5337 LONE PINE LAND	95650	VCP
LOOMIS	S106198555	LOOMIS SANITARY LANDFILL	ONG PLACE (WINTERS RD); 1 MI S KING RD	95650	SWF/LF
LOOMIS	S106447336	LOOMIS, TOWN OF, CORP. YARD	TAYLOR RD	95650	CA PLACER CO. MS
LOOMIS	S104180906	WORLDCOM - LOOMIS SITE	TAYLOR NEAR KING RD	95650	CA PLACER CO. MS
LOOMIS	U001613278	SIERRA STATION #12	8705 TAYLOR ROAD	95650	HIST UST
LOOMIS	S105982391	PCWA - LOOMIS	VAL VERDE RD	95650	CA PLACER CO. MS
LOOMIS	S106486854	LOOMIS LANDFILL	WINTERS ROAD	95650	CA SLIC
LOOMIS	1006837107	LOOMIS SANITARY LANDFILL	WINTERS RD; 1 MI S KING RD	95650	FINDS
ROCKLIN	1003879731	SOUTHERN PACIFIC (ROUNDHOUSE)	CORNER OF FIRST & ROCKLIN RD.	95677	CERC-NFRAP
ROCKLIN	S105628722	ROCK CREEK AKA: SUNWEST #1	LITTLE ROCK ROAD/NORTH HIGHWAY 65	95677	SCH
ROCKLIN	U003942538	U.S. RENTALS SERVICE, #29	4755 PACIFIC ST	95677	UST
ROCKLIN	1003878030	ROCKLIN DUMP	ROCKLIN RD	95677	CERC-NFRAP
ROCKLIN	1006805094	CHEVRON STATION NO 205777	4211 SIERRA	95677	RCRA-SQG, FINDS
SUNSET WHITNEY RANCH	1000299404	FORMICA CORP	3500 CINCINNATI AVE	95677	FINDS, LUST, CHMIRS, Cortese, RCRA-LQG, RCRA-TSDF, CORRACT CERC-NFRAP, CA WDS, HIST UST, EMI

GOVERNMENT RECORDS SEARCHED/DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/14/04
Date Made Active at EDR: 02/03/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 02/01/05
Elapsed ASTM days: 2
Date of Last EDR Contact: 02/01/05

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 6
Telephone: 214-655-6659

EPA Region 8
Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 12/14/04
Date Made Active at EDR: 02/03/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 02/01/05
Elapsed ASTM days: 2
Date of Last EDR Contact: 02/01/05

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/14/04
Date Made Active at EDR: 02/08/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/21/04
Elapsed ASTM days: 49
Date of Last EDR Contact: 12/21/04

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

STREET AND ADDRESS INFORMATION

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GEOCHECK®: PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

LOOMIS PROPERTY
SIERRA COLLEGE BLVD, BRACE RD
LOOMIS, CA 95650

TARGET PROPERTY COORDINATES

Latitude (North):	38.808800 - 38' 48' 31.7"
Longitude (West):	121.204300 - 121' 12' 15.5"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	655919.9
UTM Y (Meters):	4296883.5
Elevation:	334 ft. above sea level

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

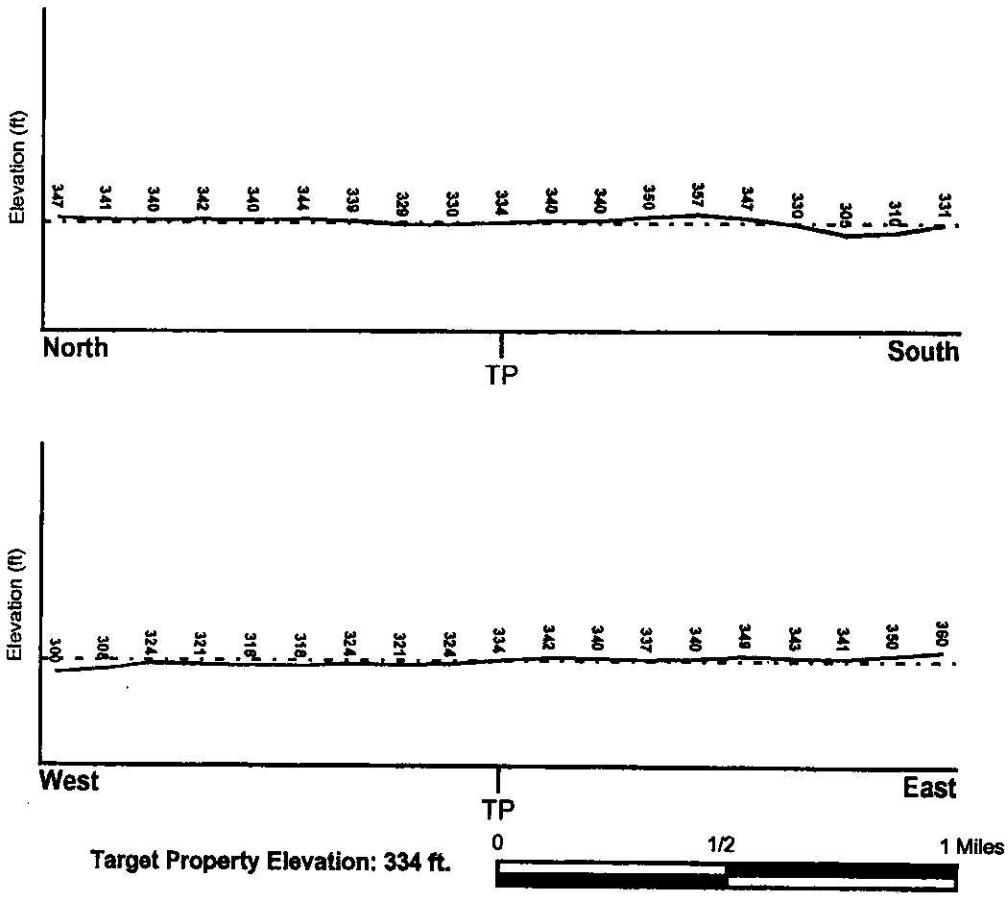
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	38121-G2 ROCKLIN, CA
General Topographic Gradient:	General WNW
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 334 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
PLACER, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property:	0607210001A
Additional Panels in search area:	0602390418D 0602420005C

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
ROCKLIN	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site-specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Mesozoic
System:	Jurassic
Series:	Jurassic
Code:	Jg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Jurassic granitic rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	ANDREGG
Soil Surface Texture:	coarse sandy loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	MODERATE
Depth to Bedrock Min:	> 20 inches
Depth to Bedrock Max:	> 40 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	15 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 7.30 Min: 5.60
2	15 inches	29 inches	coarse sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 6.50 Min: 5.60
3	29 inches	33 inches	weathered bedrock	Not reported	Not reported	Max: 0.00 Min: 0.00	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: gravelly - coarse sandy loam
sandy loam
unweathered bedrock

Surficial Soil Types: gravelly - coarse sandy loam
sandy loam
unweathered bedrock

Shallow Soil Types: clay

Deeper Soil Types: unweathered bedrock

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS0148243	1/4 - 1/2 Mile NNW
2	USGS0148244	1/4 - 1/2 Mile NW
3	USGS0148238	1/2 - 1 Mile East
4	USGS0148167	1/2 - 1 Mile SE
A5	USGS0148175	1/2 - 1 Mile West
6	USGS0148173	1/2 - 1 Mile West
A7	USGS0148239	1/2 - 1 Mile West
B8	USGS0148233	1/2 - 1 Mile ESE
9	USGS0148235	1/2 - 1 Mile ESE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

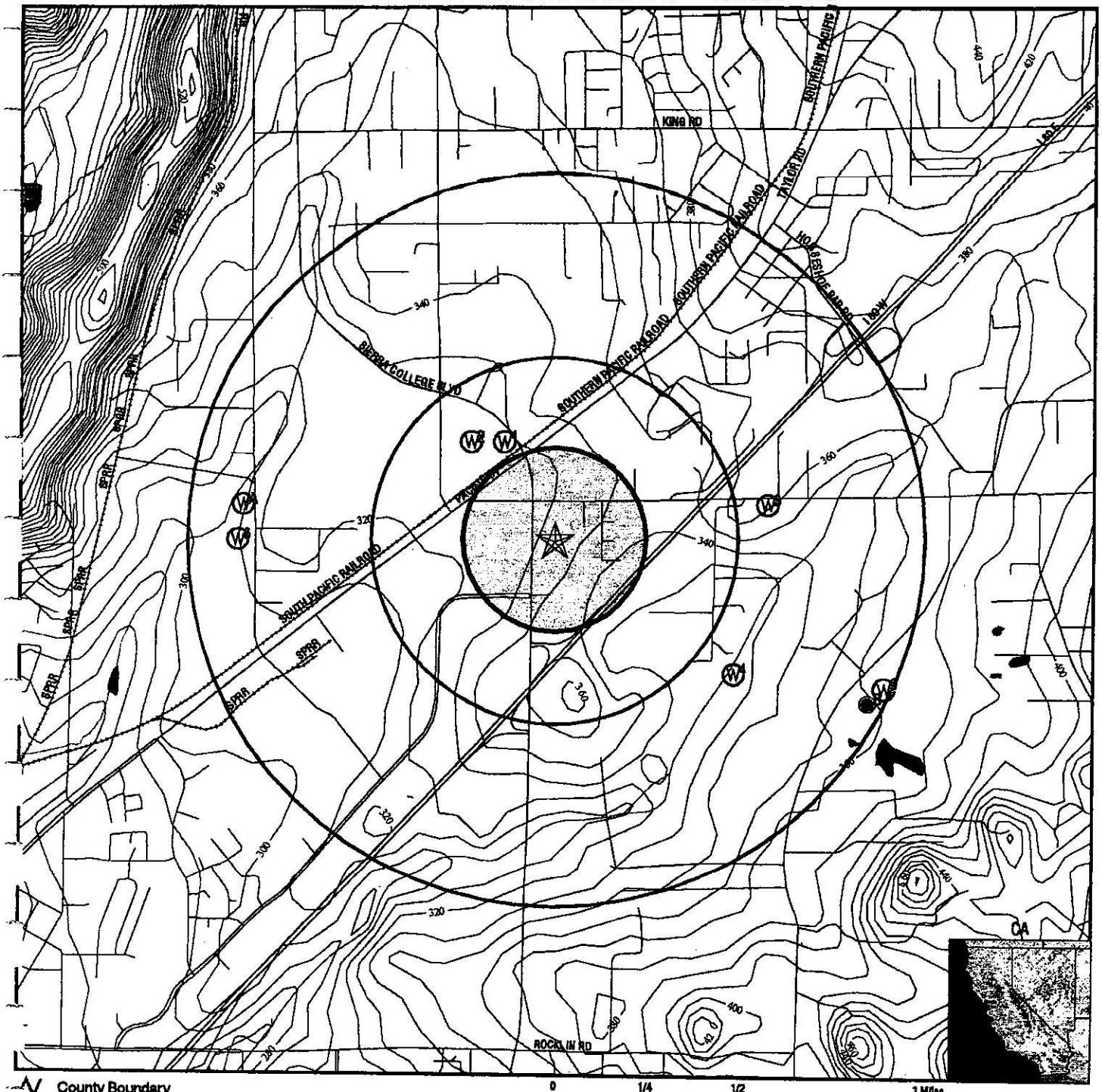
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B10	10382	1/2 - 1 Mile ESE

PHYSICAL SETTING SOURCE MAP - 1368052.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

0 1/4 1/2 1 Miles

N

TARGET PROPERTY:	Loomis Property	CUSTOMER:	Soil Search Engineering
ADDRESS:	Sierra College Blvd, Brace Rd	CONTACT:	Ahmad Badie
CITY/STATE/ZIP:	Loomis CA 95650	INQUIRY #:	1368052.2s
LAT/LONG:	38.8088 / 121.2043	DATE:	February 25, 2005 2:51 pm

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Map ID Direction Distance Elevation	Database	EDR ID Number
1 NNW 1/4 - 1/2 Mile Lower	FED USGS	USGS0148243

Agency:	USGS	Site ID:	384846121122101
Site Name:	011N007E09N002M		
Dec. Latitude:	38.81268		
Dec. Longitude:	-121.20689		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	325.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19770209	Inven Date:	19820715
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	172		
Hole depth:	172	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1982-07-15	7.36	

Note: The site had been pumped recently.

2 NW 1/4 - 1/2 Mile Lower	FED USGS	USGS0148244

Agency:	USGS	Site ID:	384846121122701
Site Name:	011N007E09N001M		
Dec. Latitude:	38.81268		
Dec. Longitude:	-121.20856		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	320.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19761102	Inven Date:	19820715
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	200BMCX		
Aquifer type:	Not Reported		
Well depth:	75.0		
Hole depth:	75.0	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-07-15	6.44				
Note: The site had been pumped recently.					
1976-11-02	40.00				

3
East
1/2 - 1 Mile
Higher

FED USGS **USGS0148238**

Agency:	USGS	Site ID:	384837121113301
Site Name:	011N007E16A001M		
Dec. Latitude:	38.81018		
Dec. Longitude:	-121.19356		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	380.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19771017	Inven Date:	19820721
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	200BMCX		
Aquifer type:	Not Reported		
Well depth:	173		
Hole depth:	173	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-07-21	14.36		1977-10-17	26.00	

4
SE
1/2 - 1 Mile
Lower

FED USGS **USGS0148167**

Agency:	USGS	Site ID:	384813121113901
Site Name:	011N007E16H001M		
Dec. Latitude:	38.80351		
Dec. Longitude:	-121.19523		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	320.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19771220	Inven Date:	19820720
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	148		
Hole depth:	148	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-07-20	5.45				
Note: The site had been pumped recently.					
1977-12-20	14.00				

A5
West
1/2 - 1 Mile
Lower

FED USGS **USGS0148175**

Agency:	USGS	Site ID:	384836121130701
Site Name:	011N007E17C001M		
Dec. Latitude:	38.8099		
Dec. Longitude:	-121.21967		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	300.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19771118	Inven Date:	19820715
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	175		
Hole depth:	175	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1977-11-18	20.00	

6
West
1/2 - 1 Mile
Lower

FED USGS **USGS0148173**

Agency:	USGS	Site ID:	384832121130901
Site Name:	011N007E17C002M		
Dec. Latitude:	38.80879		
Dec. Longitude:	-121.22023		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	305.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19800328	Inven Date:	19820721
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	200		
Hole depth:	200	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1980-03-28	30.00	

A7
West
1/2 - 1 Mile
Lower

FED USGS **USGS0148239**

Agency:	USGS	Site ID:	384838121130901
Site Name:	011N007E08P001M		
Dec. Latitude:	38.81046		
Dec. Longitude:	-121.22023		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	320.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19780724	Inven Date:	19820715
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	Not Reported		
Hole depth:	200	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1982-07-15	5.15	

B8
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS0148233**

Agency:	USGS	Site ID:	384810121111701
Site Name:	011N007E15M002M		
Dec. Latitude:	38.80268		
Dec. Longitude:	-121.18912		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	355.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19770708	Inven Date:	19820720
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	175		
Hole depth:	175	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1977-07-08	30.00	

9
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS0148235**

Agency:	USGS	Site ID:	384811121111201
Site Name:	011N007E15M001M		
Dec. Latitude:	38.80296		
Dec. Longitude:	-121.18773		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	359.00		
Hydrologic code:	18020111		
Topographic:	Undulating		
Site Type:	Ground-water other than Spring		
Const Date:	19770701	Inven Date:	19820720
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported		
Well depth:	175		
Hole depth:	175	Source:	driller
Project no:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1977-07-01	60.00	

B10
ESE
1/2 - 1 Mile
Higher

CA WELLS **10382**

Water System Information:

Prime Station Code:	11N/07E-15M03 M	User ID:	31C
FRDS Number:	3100062001	County:	Placer
District Number:	61	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	384808.0 1211113.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	C.C. WELL		
System Number:	3100062		
System Name:	INDIAN CREEK COUNTRY CLUB		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zip	Total Sites	> 4 Pci/L	Pct. > 4 Pci/L
95650	11	0	0.00

Federal EPA Radon Zone for PLACER County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 95650

Number of sites tested: 6

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.817 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations for District 2, 3, 5 and 6
Source: Department of Conservation
Telephone: 916-323-1779

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

APPENDIX C

ADDITIONAL SERVICE

SOIL SEARCH ENGINEERING
GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
4088 BRIDGE ST. #9, FAIR OAKS, CA 95628 (916)966-3902

Soil Search Engineering Services

Soil Search Engineering is pleased to present geotechnical and environmental investigation, material testing, construction observation and quality control services for your project. Services provided consist of, but not limited to the following:

GEOTECHNICAL ENGINEERING
RESIDENTIAL , COMMERCIAL
STORAGE BIN, TOWER, DAM
RETAINING WALL & SEA WALL
FOUNDATION INVESTIGATION
SEISMIC FOUNDATION DESIGN
PLAN REVIEW
CONSTRUCTION SUPERVISION
CONSTRUCTION INSPECTION
FIELD TESTING AND OBSERVATION
SOIL LABORATORY TESTING
PAVEMENT DESIGN

ENVIRONMENTAL ASSESSMENT
PHASE I AND PHASE II SITE ASSESSMENTS
SITE CHARACTERIZATION
GROUNDWATER INVESTIGATION
GROUNDWATER MONITORING
L.U.F.T. INVESTIGATIONS
COASTAL PROTECTION PROJECTS
FIELD INVESTIGATION
SOIL AND WATER SAMPLING

If you have any question or require additional information, call our office at your convenience. Please feel free to contact our office for further information regarding our services and fees. Proposals will be provided upon request.

APPENDIX D
HISTORICAL RESEARCH DOCUMENTATION

SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

Inquiry Number: 4722099.7
September 12, 2016

EDR Environmental Lien and AUL Search

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Environmental Lien and AUL Search

The EDR Environmental Lien and AUL Search Report provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied address information to:

- search for parcel information and/or legal description;
- search for ownership information;
- research official land title documents recorded at jurisdictional agencies such as recorders' offices, registries of deeds, county clerks' offices, etc.;
- access a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument(s) (title, parties involved, and description); and
- provide a copy of the deed or cite documents reviewed.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EDR Environmental Lien and AUL Search

TARGET PROPERTY INFORMATION

ADDRESS

SEC Brace Rd and Sierra College Blvd
SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

RESEARCH SOURCE

Source 1:

Placer Recorder
Placer, CA

PROPERTY INFORMATION

Deed 1:

Type of Deed:	deed
Title is vested in:	Donald B & Carole F Tanklage Foudnation
Title received from:	Stephen C & Virginia A Patterson Trustees
Deed Dated	10/11/2011
Deed Recorded:	11/17/2011
Book:	NA
Page:	na
Volume:	na
Instrument:	na
Docket:	NA
Land Record Comments:	
Miscellaneous Comments:	
Legal Description:	See Exhibit
Legal Current Owner:	Donald B & Carole F Tanklage Foundation
Parcel # / Property Identifier:	045-024-034-000, 045-024-035-000, 045-024-036-000, 045-024-037-000
Comments:	See Exhibit

ENVIRONMENTAL LIEN

Environmental Lien: Found ☐ Not Found ☒

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

AULs: Found ☐ Not Found ☒

Deed Exhibit 1

RECORDING REQUESTED BY:
FIDELITY NATIONAL TITLE CO.

RECORDING REQUESTED BY:
Dennis G. Wagstaffe

AND WHEN RECORDED MAIL TO:
Dennis G. Wagstaffe
PO Box 5009
Redwood City, CA 94063

PLACER, County Recorder
JIM MCCAULEY
DOC- 2011-0092281-00
FIDELITY TITLE
THURSDAY, NOV 17, 2011 12:39:45

MIC	$3.00	AUT	$8.00	SBS	$7.00
ERD	$1.00	RED	$1.00	REC	$16.00
ADD	$0.00				

Ttl Pd $36.00 Rcpt # 02155087
clkdlmlfj1/GV/1-8

The space above for Recorder's use only

DEED-IN-LIEU OF FORECLOSURE

THE UNDERSIGNED GRANTORS DECLARE:

(1) The grantee herein was the foreclosing beneficiary.
(2) The amount of the unpaid debt together with costs was: $3,000,000.00
(3) The amount paid by the grantee over and above the unpaid debt was: $1.00
(4) The documentary transfer tax is: - 0 -
(5) Said property is in the City of Loomis, County of Placer, State of California.

FOR VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, STEPHEN C. PATTERSON AND VIRGINIA A. PATTERSON, TRUSTEES OF THE PATTERSON FAMILY TRUST hereby **GRANT** to DONALD B. TANKLAGE AND CAROLE F. TANKLAGE FOUNDATION, a nonprofit public benefit corporation, the following described real property in the City of Loomis, County of Placer, State of California, described as follows:

SEE LEGAL DESCRIPTION ATTACHED AS EXHIBIT "A"

RECITALS

This Deed-in-Lieu of Foreclosure is an absolute conveyance the grantors having sold said real property to the grantee for a fair and adequate consideration such consideration in addition to that above recited being full satisfaction of all personal obligations of the Trustors under that certain promissory note dated August 31 2005. Said note is secured by the deed of trust executed by STEPHEN C. PATTERSON and VIRGINIA A. PATTERSON, Trustees of the Patterson Family Trust to FIDELITY NATIONAL TITLE COMPANY, a California Corporation as trustee, for the benefit of DONALD B TANKLAGE AND CAROLE F. TANKLAGE FOUNDATION a non profit public benefit corporation, as beneficiary recorded August 31 2005 as instrument No. 2005-0116417, Official Records of Placer County. Said deed of trust is NOT being reconveyed and remains secured against the said real property.

ST

Grantors declare that this conveyance is freely and fairly made.

Dated: 10/11, 2011

STEPHEN C. PATTERSON, Trustee

VIRGINIA A. PATTERSON, Trustee

MAIL TAX STATEMENTS TO: TANKLAGE FOUNDATION, 1025 TANKLAGE ROAD, SAN CARLOS CA 94070

CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

STATE OF CALIFORNIA)
)
COUNTY OF Placer)

On October 11, 2011 before me, ~~the undersigned~~ Janet L. Yoho Notary Public, personally appeared **STEPHEN C PATTERSON,** ~~personally known to me (or~~ who proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that, he executed the same in his authorized capacity, and that by his signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument. I certify under Penalty of Perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Janet L. Yoho (SEAL)

JANET L. YOHO
Commission # 1885677
Notary Public - California
Placer County
My Comm. Expires May 9, 2014

CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

STATE OF CALIFORNIA)
)
COUNTY OF Placer)

On October 11, 2011 before me, ~~the undersigned~~ JANET L. YOHO Notary Public, personally appeared **VIRGINIA A. PATTERSON,** ~~personally known to me (or~~ who proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that, she executed the same in her authorized capacity, and that by her signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument. I certify under Penalty of Perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Janet L. Yoho (SEAL)

JANET L. YOHO
Commission # 1885677
Notary Public - California
Placer County
My Comm. Expires May 9, 2014

MAIL TAX STATEMENTS TO: TANKLAGE FOUNDATION, 1025 TANKLAGE ROAD, SAN CARLOS CA 94070

ESTOPPEL AFFIDAVIT

Affidavit of Individual Giving Deed in Lieu of Foreclosure

STATE OF CALIFORNIA

COUNTY OF PLACER

STEPHEN C. PATTERSON and VIRGINIA A. PATTERSON, as Co-trustees of the Patterson Family Trust, being first duly sworn, depose and say:

That they are the identical parties who made executed and delivered that certain grant deed to the DONALD B. TANKLAGE AND CAROLE F. TANKLAGE FOUNDATION, a non profit public benefit corporation dated 1-1 2011, conveying the real property situated in the City of Loomis, County of Placer, State of California, more particularly described in Exhibit "A" attached hereto.

That afiants now are and at all times herei mentioned were STEPHEN C. PATTERSON and VIRGINIA A. PATTERSON.

That the aforesaid Deed is intended to be and is an absolute conveyance of the title to said premises ot the Grantee named herein, and was not and is not now intended as a mortgage, trust conveyance, or security of any kind; that it was the intention of affiants as Grantors in said Deed to convey, and by said Deed these affiants did convey to the Grantee therein all their right, title, and interest absolutely in and to said premises; that possession of said premises, subject to the possessory rights of tenants therein, has been surrendered to the Grantee;

That in the execution and delivery of said Deed, affiants were not acting under any misapprehension as to the effect thereof, and acted freely and voluntarily and were not acting under coercion or duress;

That the consideration for said Deed was and is cancellation of all debts, obligations, costs and charges of STEPHEN C. PATTERSON, VIRGINIA A. PATTERSON and the Patterson Family Turst secured by that certain Deed of Trust heretofore existing on said property executed by STEPHEN C. PATTERSON and VIRGINIA A. PATTERSON, Trustees of the Patterson Family Trust to FIDELITY NATIONAL TITLE COMPANY, a California Corporation as trustee, for the benefit of DONALD B TANKLAGE AND CAROLE F. TANKLAGE FOUNDATION a non profit public benefit corporation, as beneficiary recorded August 31, 2005 as instrument No. 2005-0116417, Official Records of Placer County.

That said deed of trust is NOT being reconveyed and remains secured against the said real property.

That at the time of making said Deed affiants believed and now believe that the aforesaid consideration therefore represents the fair value of hte property so deeded;

This affidavit is made for the protection and benefit of the Grantee in said Deed, its successors and assigns and all other parties hereafter dealing with or who may acquire an interest in the property herein described, and particularly for the benefit of Fidelity National Title Company which is about to insure the title to said property in reliance thereon and any other title company which may hereafter insure the title to said property.

That affiants and each of them will testify declare depose or certify before any competent tribunal officer or person in any case now pending or which may hereafter be instituted to the truth of the particular facts herein above set forth.

Dated: 10/11, 2011

STEPHEN C. PATTERSON, Trustee

VIRGINIA A. PATTERSON, Trustee

CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

STATE OF CALIFORNIA)
)
COUNTY OF Placer)

On October 11, 2011 before me, ~~the undersigned~~ Janet L. Yoho Notary Public, personally appeared **STEPHEN C PATTERSON,** ~~personally known to me (or~~ who proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that, he executed the same in his authorized capacity, and that by his signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument. I certify under Penalty of Perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Janet L Yoho (SEAL)

JANET L. YOHO
Commission # 1885677
Notary Public - California
Placer County
My Comm. Expires May 9, 2014

CERTIFICATE OF ACKNOWLEDGMENT OF NOTARY PUBLIC

STATE OF CALIFORNIA)
)
COUNTY OF Placer)

On October 11, 2011 before me, ~~the undersigned~~ Janet L Yoho Notary Public, personally appeared **VIRGINIA A. PATTERSON,** ~~personally known to me (or~~ who proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that, she executed the same in her authorized capacity, and that by her signature on the instrument the person or the entity upon behalf of which the person acted, executed the instrument. I certify under Penalty of perjury under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Janet L. Yoho (SEAL)

JANET L. YOHO
Commission # 1885677
Notary Public - California
Placer County
My Comm. Expires May 9, 2014

LEGAL DESCRIPTION

EXHIBIT "A"

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE TOWN OF LOOMIS, COUNTY OF PLACER, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL ONE:

Lots 25 and 26 of the Himes Tract as shown on the Map thereof filed in Book "A" of Maps, Page 30, Placer County Records

EXCEPTING THEREFROM all those portions conveyed to the County of Placer by Deeds recorded June 20, 1960 in Book 839 of Official Record, Page 289, and recorded June 27, 1962 in Book 923 of Official Records, Page 455.

ALSO EXCEPTING THEREFROM all that portion conveyed to James L. Clark, et ux, by Deed recorded in Book 934 of Official Records, Page 581.

ALSO EXCEPTING THEREFROM all that portion conveyed to Ray H. Maxwell by Deed recorded in Book 959 of Official Records, Page 13.

ALSO EXCEPTING THEREFROM all that portion conveyed to Roman Catholic Bishop of Sacramento by Deed recorded in Book 976 of Official Records, Page 526.

PARCEL TWO:

The West 105 feet of the following described property:

A portion of Lots 25 and 26 of the Himes Tract, described as follows:

Beginning at a point at the intersectiom of Himes and Brace Roads (North 417,519.68 East 2,226.711.31, California Zone II coordinates) from which the Northeast corner of Section 16, Township 11 North, Range 7 East, M.D.B.& M. (North 417,639.39 East 2,230,674.02, California Zone II Coordinates as filed in the Official Records of Placer County of State Highway II-Pla-17-A-Sec. B Roseville to Newcastle) bears North 88°23'59" East 3964.26 feet, and a railroad spike bears North 02°31'17" East 6.96 feet; thence from said point of beginiting North 88°55'07" East 880.23 feet to the East line of said Lot 25 of the Himes Tract; thence South 01°04'53" East 30.00 feet; thence South 0°02'23" East 130.01 feet; thence South 88°55'07" West 155 feet to the Southeast corner of the parcel to be deacribed hereby, the true point of beginning; thence South 88°55'07" West 525.0 feet; thence North 0°22'23" West 130.0 feet; thence North 88°55'07" East 505.0 feet; thence South 45°44' East 28.11 feet; thence South 0°22'23" East 110.0 feet to the true point of beginning

PARCEL THREE:

A portion of Lot 25 of the Himes Tract, described as follows:

Beginning at a point at the intersectiom of Himes and Brace Roads (North 417,519.68 East 2,226.711.31, California Zone II coordinates) from which the Northeast corner of Section 16, Township 11 North, Range 7 East, M.D.B.& M. (North 417,639.39 East 2,230,674.02, California Zone II Coordinates as filed in the Official Records of Placer County of State Highway II-Pla-17-A-Sec. B Roseville to Newcastle) bears North 88°23'59" East 3964.26 feet, and a railroad spike bears North 02°31'17" East 6.96 feet; thence from said point of beginiting North 88°55'07" East 880.23 feet to the East line of said Lot 25 of the Himes Tract; thence South 01°04'53" East 30.00 feet; thence South 0°22'03" East 130.01 feet along the Easterly line of Lot 25 to the point of beginning for the description of this parcel; thence South 0°02'23" East 215.02 feet; thence North 88°55'07" West 105 feet;

thence North 00°22'23" West 215.02 feet; thence North 88°55'07" East 105 feet to the point of beginning.

EXCEPTING THEREFROM the South 100.0 feet thereof.

PARCEL FOUR:

The South 350 feet of Lots 25 and 26 of the Himes Tract as shown on the Map thereof filed in Bok "A of Maps, Page 30, Placer County Records

EXCEPTING THEREFROM all those portions conveyed to the County of Placer by Deeds recorded June 20, 1960 in Book 839 of Official Record; Page 289, and recorded June 27, 1962 in Book 923 of Official Records, Page 455.

PARCEL FIVE:

A portion of Lot 25 of the Himes Tract as shown on the Map thereof filed in Book "A" of Maps, Page 30, Placer County Records, described as follows:

Beginning at a point at the intersectiom of Himes and Brace Roads (North 417,519.68 East 2,226.711.31, California Zone II coordinates) from which the Northeast corner of Section 16, Township 11 North, Range 7 East, M.D.B.& M. (North 417,639.39 East 2,230,674.02, California Zone II Coordinates as filed in the Official Records of Placer County of State Highway II-Pla-17-A-Sec. B Roseville to Newcastle) bears North 88°23'59" East 3964.26 feet, and a railroad spike bears North 02°31'17" East 6.96 feet; thence from said point of beginiting North 88°55'07" East 880.23 feet to the East line of said Lot 25 of the Himes Tract; thence South 01°04'53" East 30.00 feet; thence South 0°02'23" East 245.03 feet along the Easterly line of Lot 25 to the true point of beginning for the description of this parcel; thence South 0°22'23" 100.00 feet; thence South 88°55'07" West 105 feet; thence North 0°22'23" West 100.00 feet; thence North 88°55'07" East 105 feet to the true point of beginning.

APN: 045-042-11, 12, 023, 034, 035, 036, 037

SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd

Loomis, CA 95650

Inquiry Number: 4722099.3

September 08, 2016

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

09/08/16

Site Name:	Client Name:
SEC Brace Rd and Sierra Colle	Kleinfelder, Inc.
SEC Brace Rd and Sierra Colle	2 Ada, Suite 250
Loomis, CA 95650	Irvine, CA 92618-0000
EDR Inquiry # 4722099.3	Contact: Karin Hagan

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Kleinfelder, Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 5AC9-4F69-B155

PO # NA

Project 201720162

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 5AC9-4F69-B155

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

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SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd

Loomis, CA 95650

Inquiry Number: 4722099.12

September 13, 2016

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

09/13/16

Site Name:

SEC Brace Rd and Sierra Colle
SEC Brace Rd and Sierra Colle
Loomis, CA 95650
EDR Inquiry # 4722099.12

Client Name:

Kleinfelder, Inc.
2 Ada, Suite 250
Irvine, CA 92618-0000
Contact: Karin Hagan

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1999	1"=500'	Acquisition Date: July 28, 1999	USGS/DOQQ
1993	1"=500'	Flight Date: January 01, 1993	USGS
1984	1"=500'	Flight Date: June 08, 1984	USDA
1975	1"=500'	Flight Date: January 01, 1975	USGS
1966	1"=500'	Flight Date: August 05, 1966	USGS
1952	1"=500'	Flight Date: July 22, 1952	USGS
1938	1"=500'	Flight Date: September 10, 1938	USDA

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INQUIRY #: 4722099.12
YEAR: 2012
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 2010
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 2009
= 500'
N
EDR

INQUIRY #: 4722099.12

YEAR: 2006

= 500'

N

EDR

INQUIRY #: 4722099.12
YEAR: 2005
= 500'
N
EDR

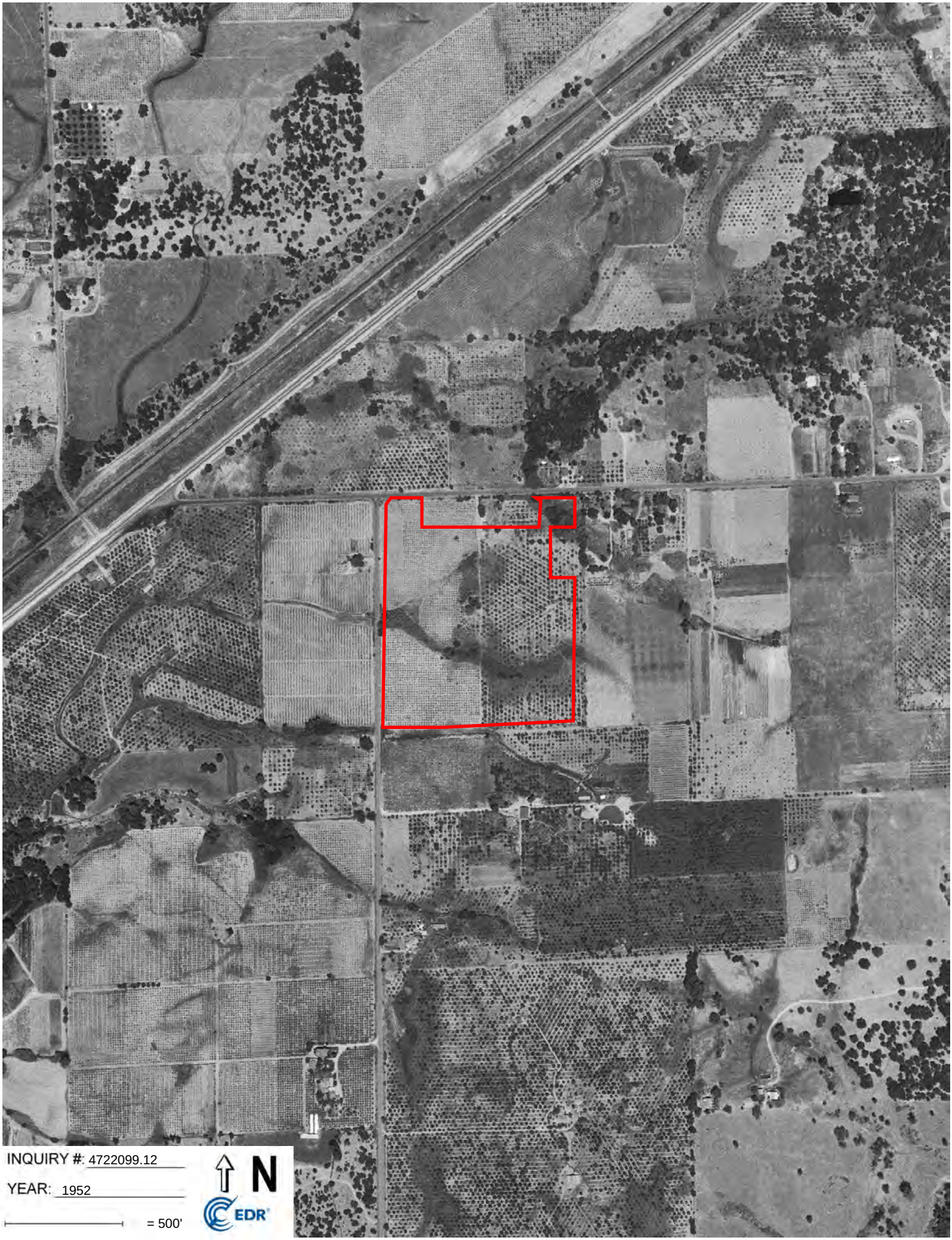
INQUIRY #: 4722099.12
YEAR: 1999
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 1993
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 1984
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 1975
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 1966
= 500'
N
EDR


INQUIRY #: 4722099.12
YEAR: 1952
= 500'
N
EDR

INQUIRY #: 4722099.12
YEAR: 1938
= 500'
N
EDR

SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

Inquiry Number: 4722099.5
September 12, 2016

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2013	☑	☐	Cole Information Services
2008	☑	☐	Cole Information Services
2003	☑	☐	Cole Information Services
1999	☑	☐	Cole Information Services
1995	☑	☐	Cole Information Services
1992	☑	☐	Cole Information Services
1990	☑	☐	Haines Criss-Cross Directory
1985	☑	☐	Haines Criss-Cross Directory
1980	☑	☐	Haines Criss-Cross Directory
1974	☑	☐	Haines Criss-Cross Directory
1970	☐	☐	Haines Criss-Cross Directory

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FINDINGS

TARGET PROPERTY STREET

SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

Year	CD Image	Source	
BRACE RD			
2013	pg A1	Cole Information Services	
2008	pg A3	Cole Information Services	
2003	pg A6	Cole Information Services	
1999	pg A9	Cole Information Services	
1995	pg A11	Cole Information Services	
1992	pg A13	Cole Information Services	
1990	pg A15	Haines Criss-Cross Directory	
1990	pg A16	Haines Criss-Cross Directory	
1985	pg A18	Haines Criss-Cross Directory	
1985	pg A19	Haines Criss-Cross Directory	
1980	pg A21	Haines Criss-Cross Directory	
1974	pg A23	Haines Criss-Cross Directory	
1974	pg A24	Haines Criss-Cross Directory	
1970	-	Haines Criss-Cross Directory	Street not listed in Source
SIERRA COLLEGE BLVD			
2013	pg A2	Cole Information Services	
2008	pg A4	Cole Information Services	
2003	pg A7	Cole Information Services	
1999	pg A10	Cole Information Services	
1995	pg A12	Cole Information Services	
1992	pg A14	Cole Information Services	
1990	pg A17	Haines Criss-Cross Directory	
1985	pg A20	Haines Criss-Cross Directory	
1980	pg A22	Haines Criss-Cross Directory	
1974	pg A25	Haines Criss-Cross Directory	
1974	pg A26	Haines Criss-Cross Directory	
1970	-	Haines Criss-Cross Directory	Street not listed in Source

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	Cole Information Services

BRACE RD 2013

5340	JAMES PUTNAM
	JESSICA RISHFORTH
5350	CECILIA SANTANA
	VICTORIA AVILA
5360	CHRISTOPHER SCHURING
	JAMES STIARWALT
5370	WENDI CRAFT
5380	BRIAN VANNATTA
	EDGAR GONZALEZ
	KRISTINE KRUG
5390	C ANDERSON
	JOEL CHURCH
5397	OCCUPANT UNKNOWN
5420	SYLVIA EPPERLY
5441	NORBERT PERDUTA
5450	PATRICIA COUNTRYMAN
5470	MADELYN COLES
5490	TINA SINNOTT
5501	MARK HARMON
5505	DAVID HOOD
5515	CHERYL BENSON
5519	COURT EDWARDS
5615	ROBERT MERRICK
5645	JANICE HUHTALA
5646	CHARLIE WEST
5842	NORMAN TRIANO

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 2013

1625	CRAIG BRYSON
2250	JOSIP ODZAK
2775	JEFFREY KOESTER
3255	PAULA HENDRIX
3275	GOLDEN POND WATER PLANTS
	JOAN GOLDEN
3315	ABRAHAM ISMAIL
3330	DAVID DUARTE
3333	BEN DICKERSON
3339	DORIS CAMPBELL
3343	BETTY UTZ
3370	FRANK DEVAI
3382	ANTARES NICULESCU
3400	EDWARD SUMMERS
3480	RYAN MIKOLASIK
3521	EUGENE WAGNER
3547	MIKE CRESPILLO
3591	OCCUPANT UNKNOWN
3611	OCCUPANT UNKNOWN
3647	ARTHUR HALL
3718	TIANA DEMASTES
3720	ROBERT SEERS
3820	DOMINIC FANELLI
3901	FIELDING LANGDON DVM
	VCA LOOMIS BASIN VETERINARY CLINIC
3921	SAM ROSE
3930	TRIMMS BUILDING MATERIALS
3940	LATUYA JAMES
4020	EMERALD DISTRIBUTING
	HORIZON WEST HEALTHCARE INC
4211	CHEVRON
	MCDONALDS
4281	7ELEVEN
4315	CARLS JR
4389	PLACER TOWING
4660	GINA JONES
4695	JOSE HUERTA
4800	LIFEHOUSE CHURCH
4830	OCCUPANT UNKNOWN
4836	LYTLE ROBERTS
4910	RON CLOVER
4960	CHARLES LENTZ
5055	DEBRA KALEY
5385	IDA OTANI
5945	CAMERON LANDERS
5955	FRED JENSON

Target Street	Cross Street	Source
✓	-	Cole Information Services

BRACE RD 2008

5340	JAMES PUTNAM
	JESSICA RISHFORTH
5350	BRYAN DOMINGUEZ
	CECILIA SANTANA
	LORI HALE
	MARY WHITLOW
	PATSIE SIMS
5360	DANIELLE ROBERTS
	LISA GIAMPIETRO
5370	CARL ROGERS
	J KILGORE
	TERESA CAZAREZ
5380	ELAINE REDMAN
	JAY MOORE
	JOSHUA MILLER
	KRISTINE KRUG
5390	GERMAINE COX
	RICHARD JOHNSON
	STEVEN WENDELL
5397	KAL KRIENKE
5420	SYLVIA EPPERLY
5441	NORBERT PERDUTA
5450	PATRICIA COUNTRYMAN
5470	EARL COLES
5490	GERALD NEAL
5501	MARK HARMON
5505	DAVID HOOD
5515	CHERYL BENSON
5519	BERT NUNN
5615	ROBERT DODD
5645	OCCUPANT UNKNOWN
5646	CLEO WEST
5815	WILLIAM BAXTER
5842	OCCUPANT UNKNOWN

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 2008

1625	CRAIG BRYSON
2250	OCCUPANT UNKNOWN
2775	JEFFREY KOESTER
3255	OCCUPANT UNKNOWN
3275	GOLDEN POND WATER PLANTS
	JOAN GOLDEN
3315	ABRAHAM ISMAIL
	IH ONLY NORTH
3333	RICHARD DICKERSON
3339	DAVID DUARTE
3343	BETTY UTZ
3370	FRANK DEVAI
3382	ANTARES NICULESCU
3400	EDWARD SUMMERS
3480	EDWARD MIKOLASIK
3521	ROBERT WAGNER
3547	MIKE CRESPILLO
3591	OCCUPANT UNKNOWN
3611	CAROL CRUMP
3647	ARTHUR HALL
3720	ROBERT SEERS
3820	DOMINIC FANELLI
3901	FELLERS GREG E DVM
	MARCIA C SMITH DVM
3921	SAM ROSE
3930	KODIAK ROOFING & WATERPROOFING CO
	TRIMMS BUILDING MATERIALS
	TRIMMS SCAFFOLDING LLC
3940	SCOTT MCINTOSH
4020	AUBURN MANOR HOLDING CORP
	CARE WEST INSURANCE CO
	EMERALD DISTRIBUTING CO INC
	FAR WEST INC
	MEDICREST OF CALIFORNIA
	RONMAR CONSTRUCTION CO INC
	ROSEVILLE CARE CENTER INC
	SHERWOOD OAKS REALTY
	SIERRA COUNTRY CLUB INVESTORS
4211	CHEVRON STATIONS INC 1581
	MCDONALDS 21304
	TONY THANDAI
4281	7 ELEVEN FOOD STORES
	UPPLE SHINDA PARAMJEET
4315	CARLS JR
4390	CONOCOPHILLIPS
4660	GINA JONES
4695	JOSE HUERTA
4800	LIFEHOUSE CHURCH
	SIERRA COLLEGE BLVD BAPTIST CHURCH
4830	OCCUPANT UNKNOWN

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 2008 (Cont'd)

4836	LYTLE ROBERTS
4910	RON CLOVER
4960	CHARLES LENTZ
5055	GRACE UYEDA
5385	IDA OTANI
5945	STEVEN STUBBS
5955	FRED JENSON
	VILLAGE PROPERTIES CONSTRUCTION

Target Street	Cross Street	Source
✓	-	Cole Information Services

BRACE RD 2003

5340	PHILIP HURST
5370	ERICA TAMARAK
	SYD DAVIS
5380	JOHN UNDERWOOD
5390	BRIAN MCALISTER
	RICHARD JOHNSON
5397	KAI KRIENKE
5420	RAYMOND EPPERLY
5441	NORBERT PERDUTA
5450	TIMOTHY BENDER
5470	EARL COLES
5490	GERALD NEAL
5501	MARK HARMON
5505	MARIAN WOLPERN
5515	OCCUPANT UNKNOWN
5519	BERT NUNN
5615	RHEA DODD
5645	WAYNE HUHTALA
5646	CLEO WEST
5815	OCCUPANT UNKNOWN
5842	BOB GRANT

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 2003

1625	CRAIG BRYSON
2232	JAMES MOLL JR PAINTING
2250	JAY PROCTOR
2775	JEFFREY KOESTER
3251	WILSON CONSTRUCTION
3255	OCCUPANT UNKNOWN
3275	GOLDEN POND WATER PLANTS
	WILLIAM GOLDEN
3315	A & K NURSERY
	ABRAHAM ISMAIL
3333	LAVISH OASIS LANDSCAPE
	RICHARD DICKERSON
3339	OCCUPANT UNKNOWN
3343	BETTY UTZ
3370	FRANK DEVAI
3400	EDWARD SUMMERS
3480	EDWARD MIKOLASIK
3521	ROBERT WAGNER
3547	MIKE CRESPILLO
3611	MICHAEL DEALBA
3647	ARTHUR HALL
3720	BROOKE RON GENERAL ENGINEERING
	RONALD BROOKE
3901	CARL B STEIN
	CHERRSTROM COREY DVM
	LOOMIS BASIN VETERINARY CTR
	RICHARD FREY
3921	BETTY ROSE
3926	ELIZABETH SYKES
3930	KODIAK ROOFING & WATERPROOFING
	OCCUPANT UNKNOWN
3940	JEFFREY NASH
	JOE JEFFREY
	KATHY LEARNED
4020	AUBURN MANOR HOLDING CORP
	CARE WEST INSURANCE CO
	EMERALD DISTRIBUTING CO
	FAR WEST INC
	HERITAGE CONVALESCENT
	HORIZON WEST HEADQUARTERS INC
	MARTIN HARMON
	SIERRA MEDICAL ENT
	WESTERN CARE CONSTRUCTION CO
	WESTGATE GARDENS INC
4181	7 ELEVEN FOOD STORES
4211	CHEVRON STATION 1581
	OCCUPANT UNKNOWN
4315	CARLS JR
	OCCUPANT UNKNOWN
4390	OCCUPANT UNKNOWN

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 2003 (Cont'd)

4390	UNOCAL 76
4660	ERIC HOUSE
4800	OCCUPANT UNKNOWN
	SIERRA CLG BLVRD BPTST CHRCH
4830	KENNETH NASSI
4836	LYTLE ROBERTS
4960	CHARLES LENTZ
	M DAVIES TRUCKING
5055	ROY UYEDA
5385	ROBERT OTANI
5955	FRED JENSON
	JENSON CONSTRUCTION
	VILLAGE PROPERTIES CNSTRCTN
	WALL CO

Target Street	Cross Street	Source
✓	-	Cole Information Services

BRACE RD 1999

5309	OCCUPANT UNKNOWN
5340	JAMES PUTNAM
	JESSICA RISHFORTH
5350	CECILIA SANTANA
	LORI HALE
	OCCUPANT UNKNOWN
	PATSIE SIMS
5360	LISA GIAMPIETRO
5370	CARL ROGERS
	J KILGORE
5380	ELAINE REDMAN
	HOLLY FAHLE
	KRISTINE KRUG
5390	RICHARD JOHNSON
5397	KAL KRIENKE
5420	SYLVIA EPPERLY
5441	NORBERT PERDUTA
5450	OCCUPANT UNKNOWN
	PATRICIA COUNTRYMAN
5470	EARL COLES
	MADELYN COLES
5490	GERALD NEAL
5501	MARK HARMON
5505	DAVID HOOD
	OCCUPANT UNKNOWN
5515	CHERYL BENSON
	OCCUPANT UNKNOWN
5519	NATALIE NUNN
5615	MAURY ADAMS
5645	JANICE HUHLALA
5646	CLEO WEST
5815	OCCUPANT UNKNOWN
	WILLIAM BAXTER
5842	NORMAN TRIANO
	OCCUPANT UNKNOWN

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 1999

1625	CRAIG BRYSON
2250	MICHAEL FILLMORE
2775	JEFFREY KOESTER
3255	OCCUPANT UNKNOWN
3275	GOLDEN POND WATER PLANTS
	JOAN GOLDEN
3315	JEFFERY ISMAIL
3333	BEN DICKERSON
3343	BETTY UTZ
3370	FRANK DEVAI
3382	ANTARES NICULESCU
3400	EDWARD SUMMERS
3480	EDWARD MIKOLASIK
3521	ROBERT WAGNER
3547	MIKE CRESPILLO
3611	CAROL CRUMP
	OCCUPANT UNKNOWN
3647	ARTHUR HALL
3720	KATHRYN SEERS
3820	DOMINIC FANELLI
3901	ANIMAL DERMATOLOGY & ALLERGY
	CANNON ANDREA G
	CHERRSTROM COREY DVM LOOMIS BASIN VETRNRY CONTER
	FELLERS GREG E DVM LOOMIS BISIN VETERINARY CENTER
	FREY RICHARD E DVM LOOMIS BASIN VETERINARY CENTER
	LOOMIS BASIN VETERINARY CENTER LARGE ANIMAL SERVICES
	LOOMIS BASIN VETERINARY CLINIC SMALL ANIMALS
	MORGAN BOB DVM LOOMIS BASIN VETERINARY CENTER
3921	SAM ROSE
3930	ARNOLDS BUMP SHOP
3940	CYNTHIA BROWN
4020	EMERALD DISTRIBUTING
	HORIZON WEST HEADQUARTERS
	RIVER CITY APPRAISAL SERVICE
4181	7 ELEVEN FOOD STORES
4211	CHEVRON STATION 1581
	MCDONALDS
4390	SIERRA COLLEGE UNION STATION
	UNOCAL 76
4660	GINA JONES
4695	JOSE HUERTA
4800	SIERRA COLLEGE BOULEVARD BAPTIST CHURCH
4836	LYTLE ROBERTS
4960	CHARLES LENTZ
5055	GRACE UYEDA
5385	IDA OTANI
5945	STEVEN STUBBS
5955	FRED JENSON

Target Street	Cross Street	Source
✓	-	Cole Information Services

BRACE RD 1995

5174	INGRAM, RON
5350	CARLSON, JEREMY
5360	HOWARD, RICHARD III
5370	SHERMAN, WILLIAM S
5397	KRIENKE, KAI
5490	NEAL, GERALD W
5505	WOLPERN, MARIAN E
5515	WILSON, GERI
5516	YOSHIKAWA, WALTER
5519	NUNN, BERT P
5615	HALL, TERRY L
5646	WEST, CLEO H

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 1995

2775	KOESTER, JEFFREY R
3275	GOLDEN, WM
3611	DEALBA, MICHAEL
3720	RONALD E BROOKE
3901	LOOMIS BASIN VETERINARY CLINIC
	LOOMIS BASIN VETERINARY CTR
	RICHARD E FREY DVM
3926	SYKES, JAS
3930	ARNOLDS BUMP SHOP
4020	BARLOW, J L
	DVORAK ARCHITECTURE INTERIORS
	EUGENE J DVORAK
	RIVER CITY APPRAISAL SVC
	SIERRA MEDICAL ENTERPRISES
4365	LOOMIS CHEVRON
4390	SIERRA COLLEGE BLVD UNION STA
4660	MARTIN, MATTHEW J
4800	SIERRA COLLEGE BOULEVARD BAP
5945	DAVIS, STEVE E
5955	JENSON, FRED G

Target Street	Cross Street	Source
✓	-	Cole Information Services

BRACE RD 1992

5174	INGRAM, RON
5350	CRESPILLO, TIMOTHY S
5360	HUNTER, MARK
5370	FINK, ROBERT
5380	RAMMEL, GARY
5390	GRADY, TIMOTHY
	OGDEN, CHRIS
	RICKS, RICHARD L
	SILVA MAINTENANCE
5420	SPARKS, WILLIAM
5490	NEAL, GERALD W
5505	WOLPERN, WESLEY
5515	WILSON, GERI
5516	YOSHIKAWA, WALTER
5519	NUNN, BERT P
5646	WEST, CLEO H
5815	BAXTER, WILLIAM F

Target Street	Cross Street	Source
✓	-	Cole Information Services

SIERRA COLLEGE BLVD 1992

2775	KOESTER, JEFFREY R
3255	SKELLENGER, RON
3275	GOLDEN, WILLIAM R
3315	ISMAIL, ABRAHAM S
3339	ISLEY, JEWELL W
3343	UTZ, BETTY J
3370	DUMITRU, NICOLAS
3382	NICULESCU, ANTARES
3480	MIKOLASIK, EDWARD A
3521	CRESPILLO, G
3547	CRESPILLO, MIKE
3611	PARSONS, DON
3647	HALL, ARTHUR R
3720	BROOKE, RONALD
3901	FREY RICHARD E DVM
	FREY, RICHARD E
	LOOMIS BASN VETRNRY
	MORGAN BOB DVM
	WIPPMAN BOB DVM
3921	ROSE, SAM
3926	SYKES, JAMES A
3930	ARNOLDS BUMP SHOP
3940	ARNOLD, DONALD
4020	ADVANCED IRRIGATION
	DVORAK ARCH INTRS
	EMERALD DISTRIBUTNG
	MEDICREST OF CA
	RIVER CITY APPRSL
	SIERRA MED ENTPRS
4365	LOOMIS CHEVRON STA
4800	SIERRA CLG BAPT CH
5955	JENSON, FRED G
	WALL COM CONST
337019	DEVAI, F

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1990

BRACE RD 95650
LOOMIS

5174	INGRAM Ron	652-6970	
5340	DARCH Bill	652-3230	+0
	DEKLE Sarah L	652-0945	+0
	LIERHEIMER R	652-3230	+0
5350	ANDERSON John S	652-9317	7
5360	GALLAMORE Janice	652-7146	9
	THOMAS Glenn	652-0616	+0

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1990

BRACE RD 95650 CONT

5370	RODRIGUEZ Linda	652-6984	+0
5380	COOKSON Laura	652-4337	8
5390	PITZER Randy	652-4132	9
	RICKS Diane K	652-7400	
	RICKS Richard L	652-7400	
	TEMPLE Alfree	652-0383	9
5420	SPARKS Stephen	652-6464	+0
	SPARKS William	652-6464	+0
5441	MUNSON Kevin L	652-0919	9
5490	NEAL Gerald W	652-3181	+0
5505	WOLPERN Wesley	652-5369	
5516	YOSHIKAWA Walter	652-6265	
5519	NUNN Bert P	652-9446	
	NUNN Bert P	652-9346	
5615	MCKOWN Jerry R	652-4957	
5646	WEST Cleo H	652-6310	
5850	WILLIAMS Gilbert	652-0874	
5850½	DICKMEYER Robert	652-0677	7
5860	WILLIAMS Ed	652-9397	
5880	WEIST Dennis	652-5765	
5895	MARTIN Fern	652-7346	
5902	HONGSLO Robt C	652-6291	
5945	RICH Ben	652-6221	
	RICH Milly	652-6221	
5955	GALVAN Jesus	652-6689	
5974	ANDERSON Axel	652-7909	
5986	HOFFART D J Mrs	652-5739	
	HOFFART Nick	652-0864	+0
6002	ASKEW Emma	652-6305	
6125	**★PRECISION DNTL SPCL**	**652-0795**	
6188	WILLIAMSON Scott	652-0064	
6217	**★FIRST ASMBLY GOD CH**	**652-6884**	
	GARDINER Jas D	652-7929	
	GARDINER Jas D Rev	652-6884	
6241	MORILLAS Tony D	652-7240	
6283	MORILLAS Ben D	652-7476	7
6310	DOMINGUEZ Audrey	652-7798	
	DOMINGUEZ Stan	652-7798	
6323	TATE F W	652-6823	
6414	**★FIRST UNITD METH CH**	**652-0469**	
	★LOOMIS CMNTY NRSRY	**652-7842**	
6498	MORILLAS Eleanor M	652-6804	
	MORILLAS Frank D	652-6804	
6532	BUCK R Frank	652-6553	

* 4 BUS 47 RES 9 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SIERRA COLLEGE BLVD 1990

SIERRA CLG BLVD 95650
LOOMIS

2775	KOESTER Jeffrey R	652-6928
3255	SKELLENGER Ron	652-5923
3275	GOLDEN Wm R	652-0655
3339	ISLEY Jewell W	652-4120
3343	UTZ Sam	652-5353 +0
3370	DEVAI Francisco	652-5309 +0
	DUMITRU Nicolas	652-0219
3382	NICULESCU Antares	652-6235
3480	MIKOLASIK Edw A	652-5456
3521	CRESPILLO Gretchen	652-6509
3547	CRESPILLO Kathy	652-9529
	CRESPILLO Mike	[illegible]
3591	MORGAN Wm G	652-5641
3647	HALL Arthur R	652-5630
3720	BROOKE Ronald E	652-0649 8
3901	★CHERRSTROM C DVM	652-5816
	★FELLERS GREG E DVM	652-5816
	★FREY RICHARD E DVM	652-5816
	★HANSON SUZANNE DVM	652-5816 9
	★JOHNSON JEFF DVM	652-5816 +0
	★LARUE LAUREN H DVM	652-5816
	★LOOMIS BASN VETRNRY	652-5816
	★LOOMIS VETRNRY CLNC	652-5816
	★MORGAN BOB DVM	652-5816
	★WIPPMAN BOB DVM	652-5816 +0
3921	ROSE Sam	652-5998
3926	SYKES Jas A	652-6965
3930	★ARNOLDS BUMP SHOP	652-5780
3940	ARNOLD Donald	652-5780
4020	★EMERALD DISTRIBUTNG	652-6930
	★MEDICREST OF CA	624-6250 +0
	★SIERRA MED ENTPRS	624-6238 +0
4365	★LOOMIS CHEVRON STA	624-6230 +0
4436	TAKAHASHI Milton	652-4486 9
4660	★NATURAL DESIGN	652-6342
4800	★SIERRA CLG BAPT CH	652-9795 +0
4830	MUNSELL Russell	652-7216
	NASSI Kenneth E	652-9396
4836	ROBERTS Lytle	652-9375
NO #	GRAY Robt C	652-7038
NO #	JACOBSON Robt E	652-6033
NO #	★MAKIMOTO GEORGE	652-0640
		652-6196

★ 18 BUS 24 RES 8 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1985

BRACE RD 95650 LOOMIS

5234		XXXX	00
5240		XXXX	00
5340		AUD B	652-4832 +5
		MATTHEWS COLLEEN	652-4856 +5
5350		GARY LARRY	652-4780 +5
		HOBBS MIKE	652-4722 +5
		SEIDLER B	652-9127 4
	B	WRIGHT THELMA	652-9314 2
5360		FORKAS J R	652-0012 3
		MILLER ROBIN	652-4601 +5
5370		GIEL GERALD	652-4522 +5
	A	LAW JEFF A	652-4017 4
	C	STACY DAVID W	652-5662 1
5380		XXXX	00
5390		RICK DIANE K	652-7400 +5
	A	KURAHARA JOHN T	652-0978 4
5397		ELZEA WM E 2D	652-9710 +5
5420		XXXX	00
5441		SILLS STEVEN L	652-5615
5460		HARPER STEVE R	652-5087 +5
		PLACER LAND&MAIN	652-3126 +5
5480		BRACE JOHN	652-6377
5505		WOLPERN WESLEY	652-5369 6
5515		XXXX	00
5516		YOSHIKAWA WALTER	652-6265
5519		NUNN BERT P	652-9346 2
		NUNN BERT P	652-9446 2
5615		XXXX	00
5645		MCCARTNEY MICHAEL S	652-5432 0
5646		WEST CLEO H	652-6310
5815		XXXX	00
5842		CORNELIUS KENNETH	652-4319 +5
5847		XXXX	00
5850		WILLIAMS ED	652-9397 1
		WILLIAMS GILBERT	652-0874 9
5874		XXXX	00
5880		WEIST DENNIS	652-5765 2
5895		MARTIN FERN	652-7346
5902		HONGSLO ROBT C	652-6291

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1985

BRACE RD		95650 CONT..	
5945	RICH BEN	652-6221	
	RICH MILLY	652-6221	
5955	GALVAN JESUS	652-6689	
	HARDER RICHARD	652-4358	+5
5974	ANDERSON AXEL	652-7909	6
5985	XXXX	00	
5986	HOFFART D J MRS	652-5739	6
6002	ASKEW EMMA	652-6305	
	ASKEW GEO D	652-6305	
6125	CORNERSTONE FITNESS	652-5212	+5
	PRECISION DNTL SPCL	652-0795	9
6151	MOUNCE ROBERT N	652-6012	8
6188	WILLIAMSON SCOTT	652-0064	2
6217	FIRST ASMBLY GOD CH	652-6884	6
	FIRST ASMBLY OF GOD	988-1368	3
	GARDINER JAMES D	652-6884	2
	GARDINER JAS D	652-7929	2
6234	XXXX	00	
6241	MORILLAS TONY D	652-7240	
6282	HENNY ANONA	652-6240	
6283	XXXX	00	
6305	XXXX	00	
6310	DOMINGUEZ STAN	652-7798	
6323	TATE F W	652-6823	
6324	XXXX	00	
6405	XXXX	00	
6414	FIRST UNITD METH CH	652-0469	3
	LOOMIS CMNTY NRSRY	652-7842	
6498	MORILLAS ELEANOR M	652-6804	
	MORILLAS FRANK D	652-6804	
*	7 BUS 62 RES	13 NEW	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SIERRA COLLEGE BLVD 1985

SIERRA CLG BLVD 95650
LOOMIS

2775	KOESTER JEFFREY R	652-6928	0
3255	SKELLENGER RON	652-5923	0
3275	GOLDEN WM R	652-0655	4
3315	HENSON LLOYD A	652-5119	
3333	DICKERSON RICHARD O	652-5629	
3339	ISLEY JEWELL W	652-4120	4
3343	UTZ SAM	652-5353	
3370	DEVAI FRANCISCO	652-5309	
	DUMITRU NICOLAS	652-0215	7
3382	NICULESCU ANTARES	652-6235	
3400	XXXX	00	
3480	MIKOLASIK EDW A	652-5456	
3521	CRESPILLO TONY	652-6509	
3547	CRESPILLO MIKE	652-6418	
3591	MORGAN WM G	652-5641	
3647	HALL ARTHUR R	652-5630	+5
3671	XXXX	00	
3720	CARTERS EGG FARM	652-5121	1
	EMERSON C DAVID	652-5121	+5
3747	XXXX	00	
3820	XXXX	00	
3901	CHERRSTROM C DVM	652-5816	2
	COYNE BONNIE DVM	652-5816	
	FELLERS GREG E DVM	652-5816	3
	FREY RICHARD E DVM	652-5816	
	LOOMIS BASN VETRNRY	652-5816	2
	LOOMIS VETRNRY CLNC	652-5816	
	MORGAN BOB DVM	652-5816	2
	WISNER ERIK DVM	652-5816	+5
3921	ROSE SAM	652-5998	
3926	SYKES JAS A	652-6965	1
3930	ARNOLDS BUMP SHOP	652-5780	8
3940	ARNOLD DONALD	652-6930	4
4245	XXXX	00	
4365	CHEVRON STATIONS	652-7474	9
	MONTGOMERYS CHEVRO	652-7474	6
4436	TAKAHASHI MILTON	652-6342	
4660	XXXX	00	
4695	TAKUMA JAS T	652-7213	
4800	SIERRA CLG BAPT CH	652-7216	4
4810	XXXX	00	
4830	MUNSELL RUSSELL	652-9396	1
	NASSI KENNETH E	652-9375	1
4836	ROBERTS LYTLE	652-7038	
4910	XXXX	00	
5055	UYEDA ROY	652-7390	
5385	XXXX	00	
5425	XXXX	00	
5945	DAVIS MARVIN	652-5412	8
NO #	JACOBSON ROBT	652-0640	9
NO #	JACOBSON ROBT CHLD	652-9020	1
★	13 BUS 38 RES	3 NEW	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1980

BRACE RD 95650 LOOMIS

5174		SKELLENGER WAYNE	652-6970
5234		XXXX	00
5240		XXXX	00
5340		WICKMAN WARREN	652-0654 +0
	B	KULINK DENNIS M	652-5048 6
5350		JONES TINA B	652-0184 +0
		REZAC NORMAN F	652-0336 +0
	B	BARLOW JAS	652-0945 +0
5360		FAYARD S L	652-6479 +0
		MCLEOD BETTY	652-0068 +0
		WILEY JAS W	652-0723 +0
	A	ELBRADER FLORENCE	652-0068 +0
5370		JOHNSON S L	652-5103 +0
		MESSNER K	652-7400 +0
		WILLIAMS L R	652-7400 +0
	A	LEWIS GLORIA	652-6395 9
5380		HOLMES JUDY R	652-6457 +0
		SNYDER BONNIE L	652-0115 +0
		YARBROUGH N L	652-6247 +0
5390		BENSO THOMAS S	652-0898 9
		DAWLEY V I	652-5056 +0
		MARTINEZ RON	652-0584 9
5397		OWENS STEVE	652-6092 +0
5420		HARPER STEVE R	652-5087 6
5441		SILLS STEVEN L	652-5615 4
5460		XXXX	00
5480		BRACE JOHN	652-6377
5505		WOLPERN WESLEY	652-5369 6
5515		MORRISON K R	652-6270
5516		YOSHIKAWA WALTER	652-6265
5519		**LEISER LOWELL SHAKL**	**652-0387** 9
		SHAKLEE DISTRIBUTOR	**652-0387** 9
5615		XXXX	00
5645		MCCARTNEY MICHAEL	652-5432 +0
5646		WEST CLEO H	652-6310
5815		XXXX	00
5847		XXXX	00
5850		WILLIAMS GILBERT	652-0874 9
5874		XXXX	00
5895		MARTIN FERN	652-7346 3
5902		HONGSLO ROBT C	652-6291
5945		RICH BEN	652-6221 2
		RICH MILLY	652-6221
5955		GALVAN JESUS	652-6689 4
5974		ANDERSON AXEL	652-7909 6
5985		TOMITA JOE	652-6567
5986		HOFFART D J MRS	652-5739 6
6002		ASKEW EMMA	652-6305
		ASKEW GEO D	652-6305 2
6125		**PRECISN DNTL SPCLTY**	**652-0795** 9
6151		MOUNCE ROBERT N	652-6012 8
6217		BRENIZER D L REV	652-6884 6
		FIRST ASMBLY GOD CH	**652-6884** 6
		POGUE ALLAN S REV	652-0811 +0
6234		DANIELS TIM A	652-0923 +0
6241		MORILLAS TONY D	652-7240
6282		HENNY ANONA	652-6240
6283		XXXX	00
6305		XXXX	00
6310		DOMINGUEZ STAN	652-7798 2
6323		TATE F W	652-6823
6324		XXXX	00
6405		MCMASTER JIM	652-6682 3
6414		**FIRST UNITD METH CH**	**652-7395** 5
		LOOMIS CMNTY NRSRY	**652-7842** 2
6498		MORILLAS ELEANOR M	652-6804 3
		MORILLAS FRANK D	652-6804 4
	★	6 BUS 61 RES	19 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SIERRA COLLEGE BLVD 1980

SIERRA CLG BLVD 95650
LOOMIS

3315	HENSON LLOYD A	652-5119	4
3333	DICKERSON RICHARD	652-5629	4
3339	JAMES R L	652-5358	4
3343	UTZ SAM	652-5353	4
3370	DEVAI FRANCISCO	652-5309	4
	DUMITRU NICOLAS	652-0215	7
3382	NICULESCU ANTARES	652-6235	4
3400	KEEFOVER VERNON L	652-5271	4
3480	MIKOLASIK EDW A	652-5456	5
3521	CRESPILLO TONY	652-6509	4
3547	CRESPILLO MIKE	652-6418	
3591	MORGAN WM G	652-5641	3
3671	XXXX	00	
3747	HALL ARTHUR R	652-5630	5
3901	CHERRSTROM COREY	652-5818	9
	FELLERS GREG E	652-5818	9
	FREY RICHARD E	652-5818	9
	LOOMIS BASIN VETRNY	652-5818	9
	LOOMIS VETERINARY	652-5818	9
3921	ROSE SAM	652-5998	5
3930	ARNOLDS BUMP SHOP	652-5780	8
4245	XXXX	00	
4365	CHEVRON STATIONS	652-7474	9
	MONTGOMERYS CHEVRO	652-7474	6
4436	TAKAHASHI MILTON	652-6342	
4660	PHILLIPS ROY T JR	652-7195	4
4695	TAKUMA JAS T	652-7213	
4810	TODD GRANT	652-0255	8
4830	NASSI E U	652-7670	
4836	ROBERTS LYTLE	652-7038	
4910	XXXX	00	
5055	UYEDA ROY	652-7390	
5385	OTANI IDA	652-7226	2
	OTANI ROBT T	652-7226	
5425	XXXX	00	
5945	DAVIS MARVIN	652-5412	8
5955	JENSEN FRED G	624-1233	+0
	JENSON FRED G	988-7743	+0
	VILLAGE PROPERTIES	988-7743	+0
NO #	JACOBSON ROBT	652-0640	9
NO #	LIEBER J	652-0746	9

★ 9 BUS 32 RES 3 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1974

BRACE RD 95650 LOOMIS

5174	SKELLENGER WAYNE	652-6970
5234	XXXX	OD
5240	GATES FRANK O JR	652-5462+4

mputer or photocopied, in any manner whatsoever excep

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

BRACE RD 1974

```
..BRACE RD                95650 CONT..
 5340 BACKUS BARTLEY        652-6789 3
 5350 HARNESS KEN           652-6738 3
5360A NELTHORPE RHONDA A    652-5276 3
 5370 DAVIS DAN A           652-6740+4
      LUMADUE JOS           652-5172
      THOMPSON MICHAEL L    652-7761+4
    B RIEG D M              652-6956+4
 5380 MURDOCK ROBT L        652-6264+4
      PUPPIONE JAS          652-7534 2
    A RICKS BETTY J         652-6646 2
 5390 DAWLEY PAUL S         652-5436+4
      DUARTE FRANK R        652-6959
      MANIORD KENNETH L     652-6434 2
 5420 ANDERSON K D          652-5682+4
 5441 SILLS STEVEN L        652-5615+4
 5480 BRACE JOHN            652-6377
 5505 WOLPERN WESLEY        652-6876 2
 5515 MORRISON K R          652-6270
 5516 YOSHIKAWA WALTER      652-6265
 5519 MUIRHEAD HARVEY JR    652-5459+4
 5615 RICKABAUGH GEO A      652-6258
 5645 SOUTHERN ROGER        652-6820 2
 5646 WEST CLEO H           652-6310
 5815 RESCH ROBT            652-6828
 5842 KENNEDY JEWELL        652-5648+4
 5847  XXXX                 00
 5874 SCHALLHORN F          652-7865
 5895 MARTIN FERN           652-7346 3
 5902 HONGSLO ROBT C        652-6291
 5945 RICH BEN              652-6221 2
      RICH MILLY            652-6221
 5955 GALVAN JESUS          652-6689+4
 5985 TOMITA JOE            652-6567
 5986 ANDERSON AXEL         652-7909+4
 6002 ASKEW EMMA            652-6305
      ASKEW GEO D           652-6305 2
 6125  XXXX                 00
 6151 DALY DENNIS E         652-6519
 6234 PHILLIPS R H          652-7007+4
 6241 MORILLAS TONY D       652-7240
 6282 HENNY ANONA           652-6240
 6283 GRIDE EDW V           652-6058
 6305*ASSEMBLY OF GOD CH    652-6884 2
      WAGNER STANLEY REV    652-6884 2
 6310 DOMINGUEZ STAN        652-7798 2
 6323 TATE F W              652-6823
 6324 CAJERO CYNTHIA L      652-6893+4
    B BROOKS RONALD J       652-5514+4
    B BROOKS VICKI L        652-5514+4
 6405 MCMASTER JIM          652-6682 3
 6414*FIRST UNTD METH CH    652-7395
     *LOOMIS HEAD START     652-7842 2
     *LOOMIS NURSERY SCHL   652-7842 2
 6498 MORILLAS ELEANOR M    652-6804 3
      MORILLAS FRANK D      652-6804+4
     *   4 BUS    54 RES    17 NEW
```

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SIERRA COLLEGE BLVD 1974

SIERRA COLLEGE BLVD 95650 LOOMIS

2250*LASSEN MOULDINGS CO652-5824+4
3315 HENSON LLOYD A 652-5119+4
3333 DICKERSON RICHARD 652-5629+4

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

SIERRA COLLEGE BLVD 1974

..SIERRA COLLEGE BLV 5650 CONT..

3339	JAMES R L	652-5358+4
3343	UTZ SAM	652-5353+4
3370	DEVAI FRANCISCO	652-5309+4
3382	NICULESCU ANTARES	652-6235+4
3400	KEEFOVER VERNON L	652-5271+4
3521	CRESPILLO TONY	652-6509+4
3547	CRESPILLO MIKE	652-6418
3591	MORGAN WM G	652-5641 3
3671	MANLEY MARK	652-6330 3
4068	CAMPBELL PAUL E	652-6515
4245	MAKABE GEO	652-6219
4365*	MONTGOMERYS CHEVRO	652-9996
4436	TAKAHASHI MILTON	652-6342
4600	XXXX	00
4660	PHILLIPS ROY T JR	652-7195+4
4695	TAKUMA JAS T	652-7213
4830	NASSI E U	652-7670
	WEST TERRY L	652-5513+4
4836	ROBERTS LYTLE	652-7038
4910	CLOVER P R	652-7997
4960	CUMMINGS DONALD	652-7034
5055	UYEDA ROY	652-7390
5385	OTANI IDA	652-7226 2
	OTANI ROBT T	652-7226
5425	COOPER MAE	652-7328
NO #	ALLEN T E	645-8897 3
NO #	BICKFORD J A	645-2292 3
NO #	BICKFORD JAS H	645-2656 3
NO #*	SIERRA CLG UN STN	652-6196+4

* 3 BUS 29 RES 12 NEW

SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd

Loomis, CA 95650

Inquiry Number: 4722099.4

September 08, 2016

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

09/08/16

Site Name:	Client Name:
SEC Brace Rd and Sierra Colle	Kleinfelder, Inc.
SEC Brace Rd and Sierra Colle	2 Ada, Suite 250
Loomis, CA 95650	Irvine, CA 92618-0000
EDR Inquiry # 4722099.4	Contact: Karin Hagan

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Kleinfelder, Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	38.809213 38° 48' 33" North
Project:	201720162	**Longitude:**	-121.203369 -121° 12' 12" West
		UTM Zone:	Zone 10 North
		UTM X Meters:	655995.90
		UTM Y Meters:	4297138.22
		Elevation:	335.81' above sea level

Maps Provided:

2012
1981
1967
1954
1944
1893
1892
1891

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

Rocklin
2012
7.5-minute, 24000

1981 Source Sheets

Rocklin
1981
7.5-minute, 24000
Photo Revised 1981
Aerial Photo Revised 1978

1967 Source Sheets

Rocklin
1967
7.5-minute, 24000
Aerial Photo Revised 1966

1954 Source Sheets

Rocklin
1954
7.5-minute, 24000
Aerial Photo Revised 1952

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1944 Source Sheets

Auburn
1944
15-minute, 62500

1893 Source Sheets

Sacramento
1893
30-minute, 125000

1892 Source Sheets

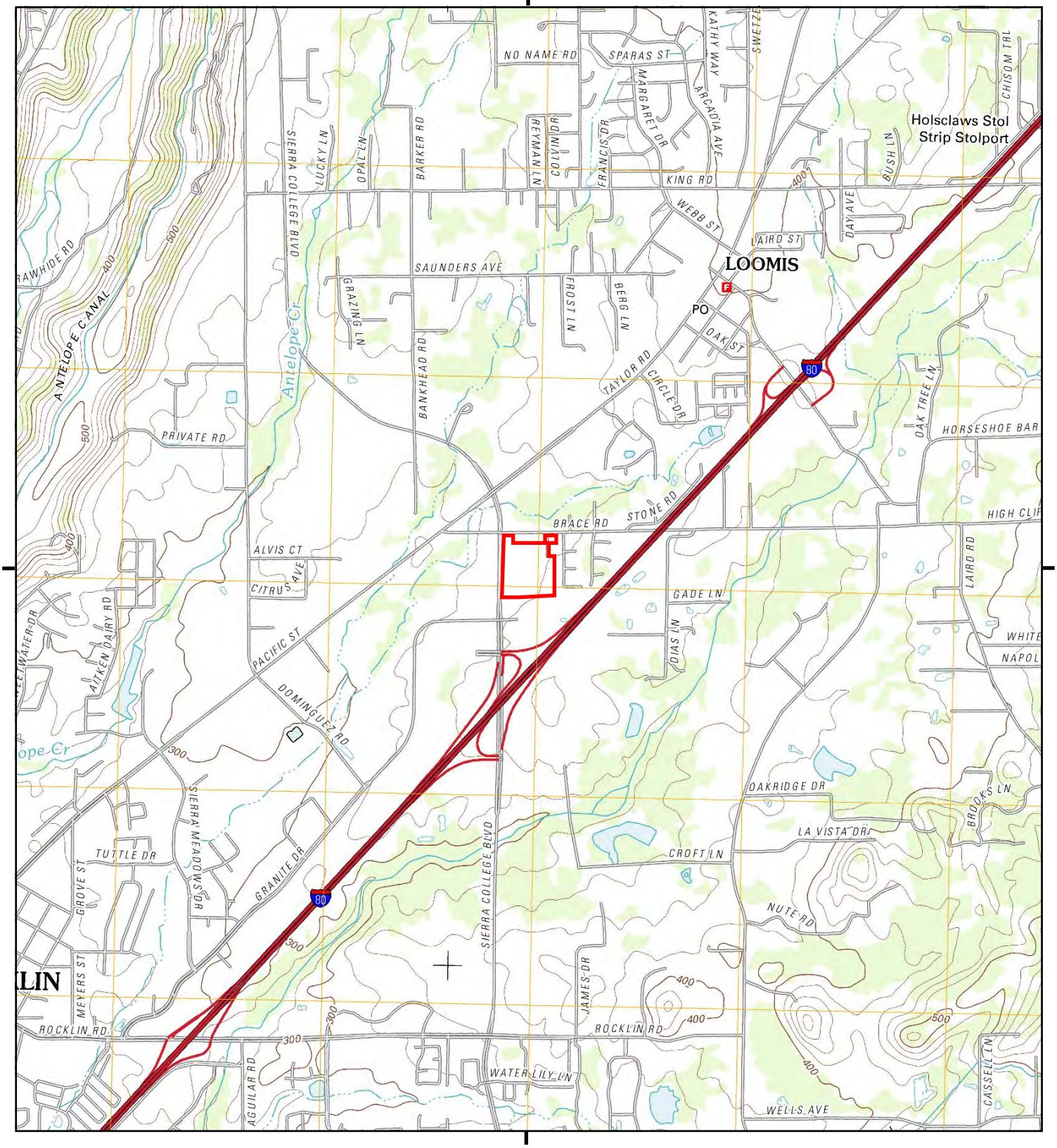
Sacramento
1892
30-minute, 125000

1891 Source Sheets

Sacramento
1891
30-minute, 125000

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

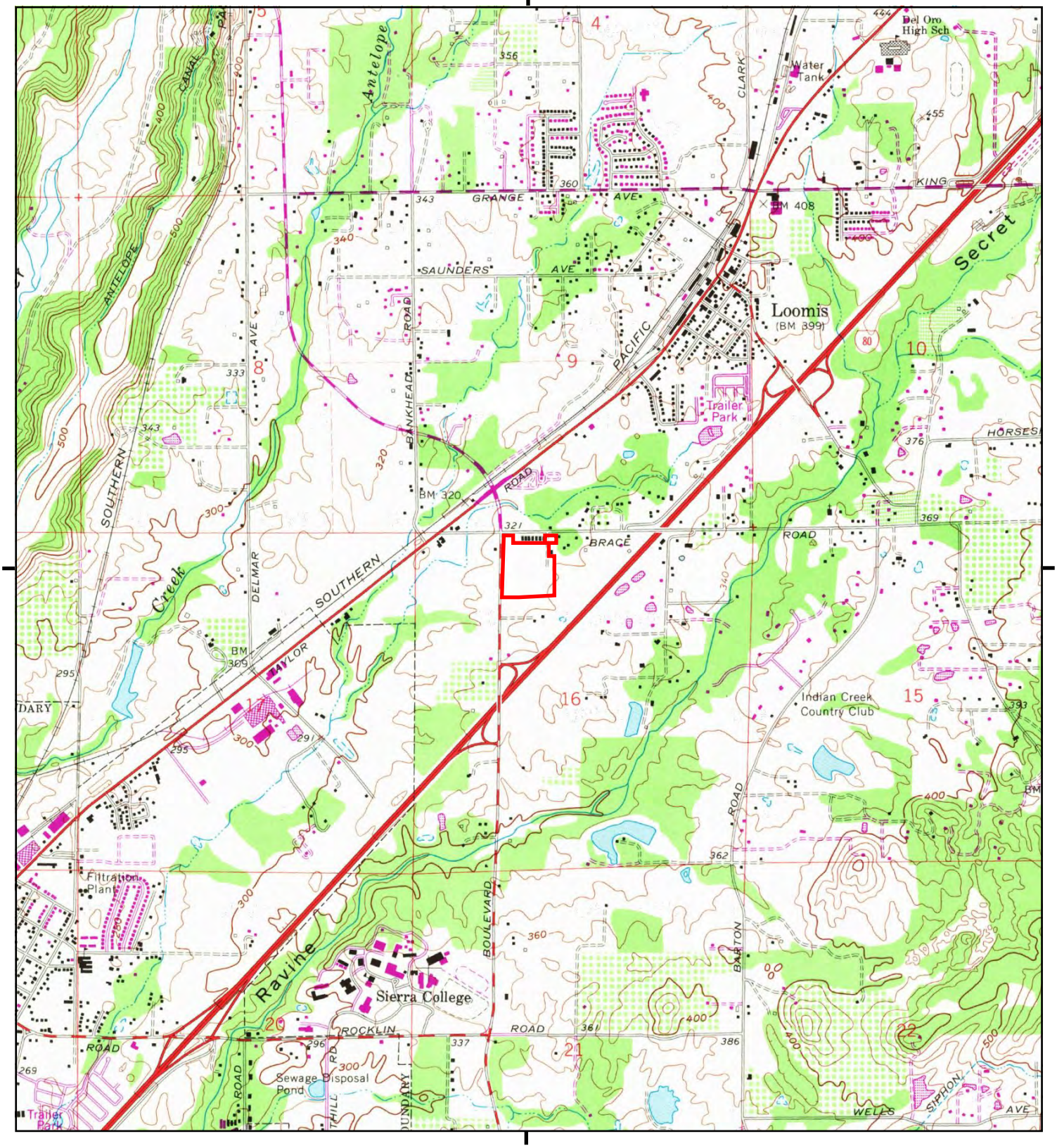
TP, Rocklin, 2012, 7.5-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1981



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

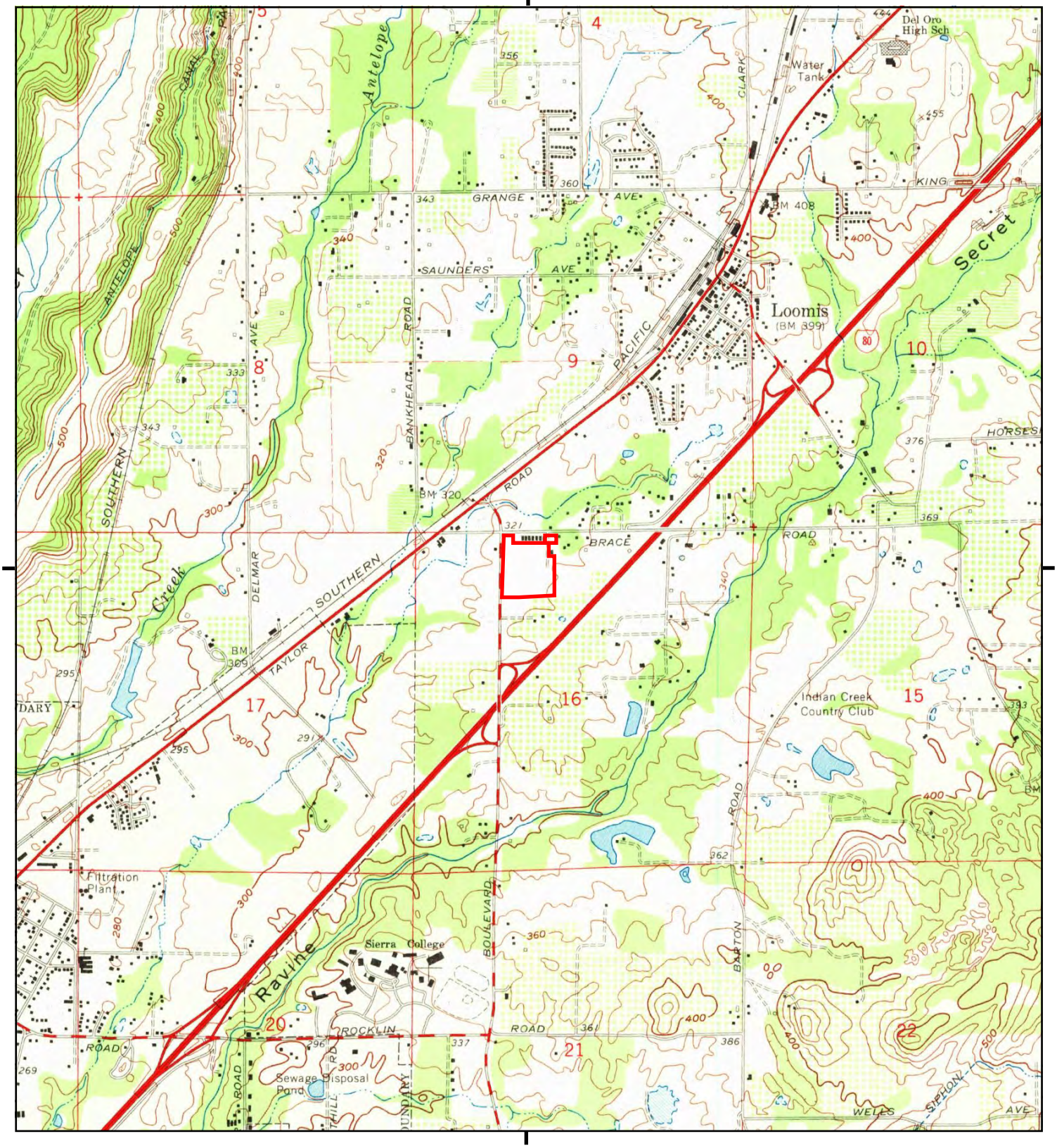
TP, Rocklin, 1981, 7.5-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1967



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

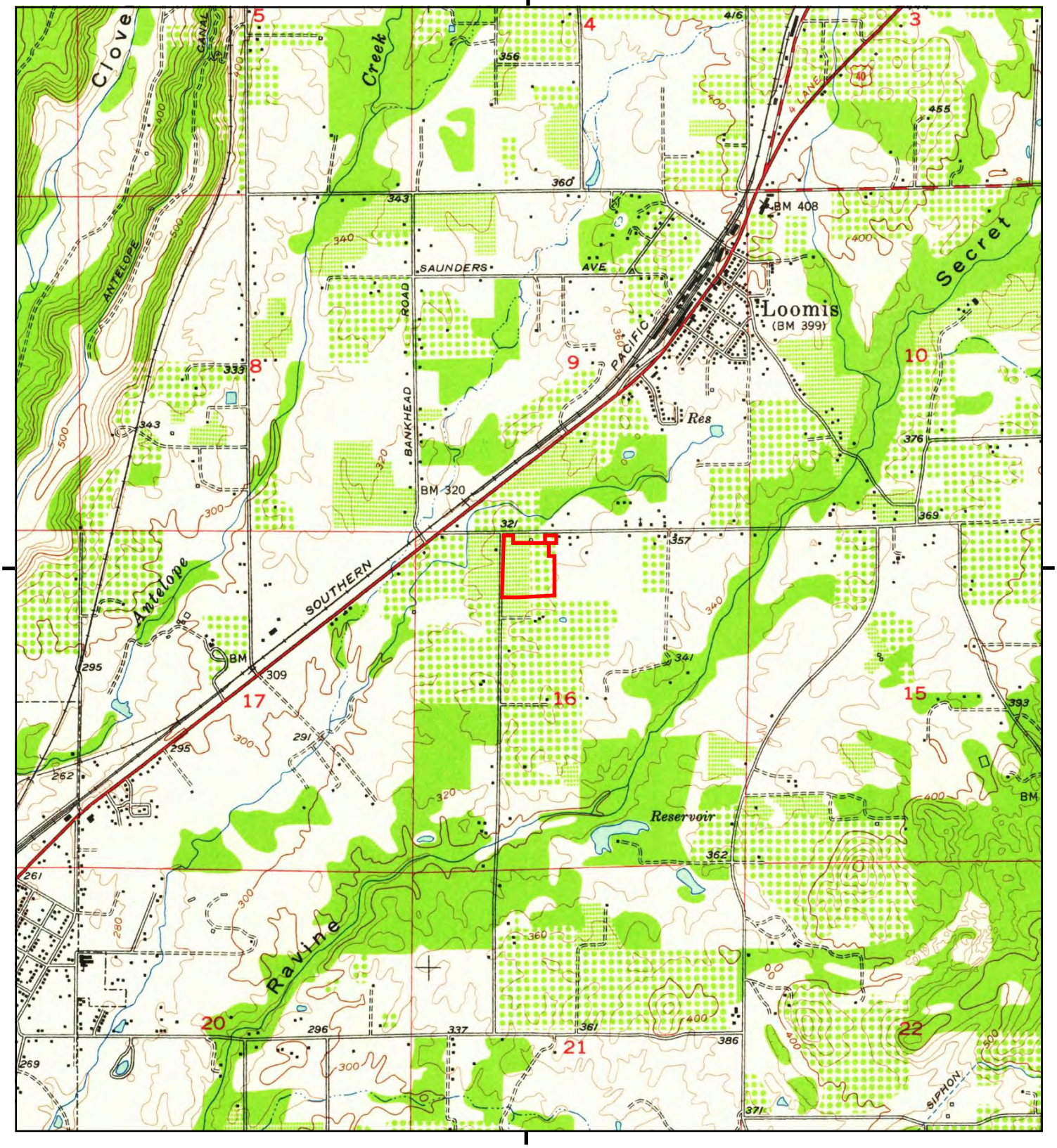
TP, Rocklin, 1967, 7.5-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1954



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

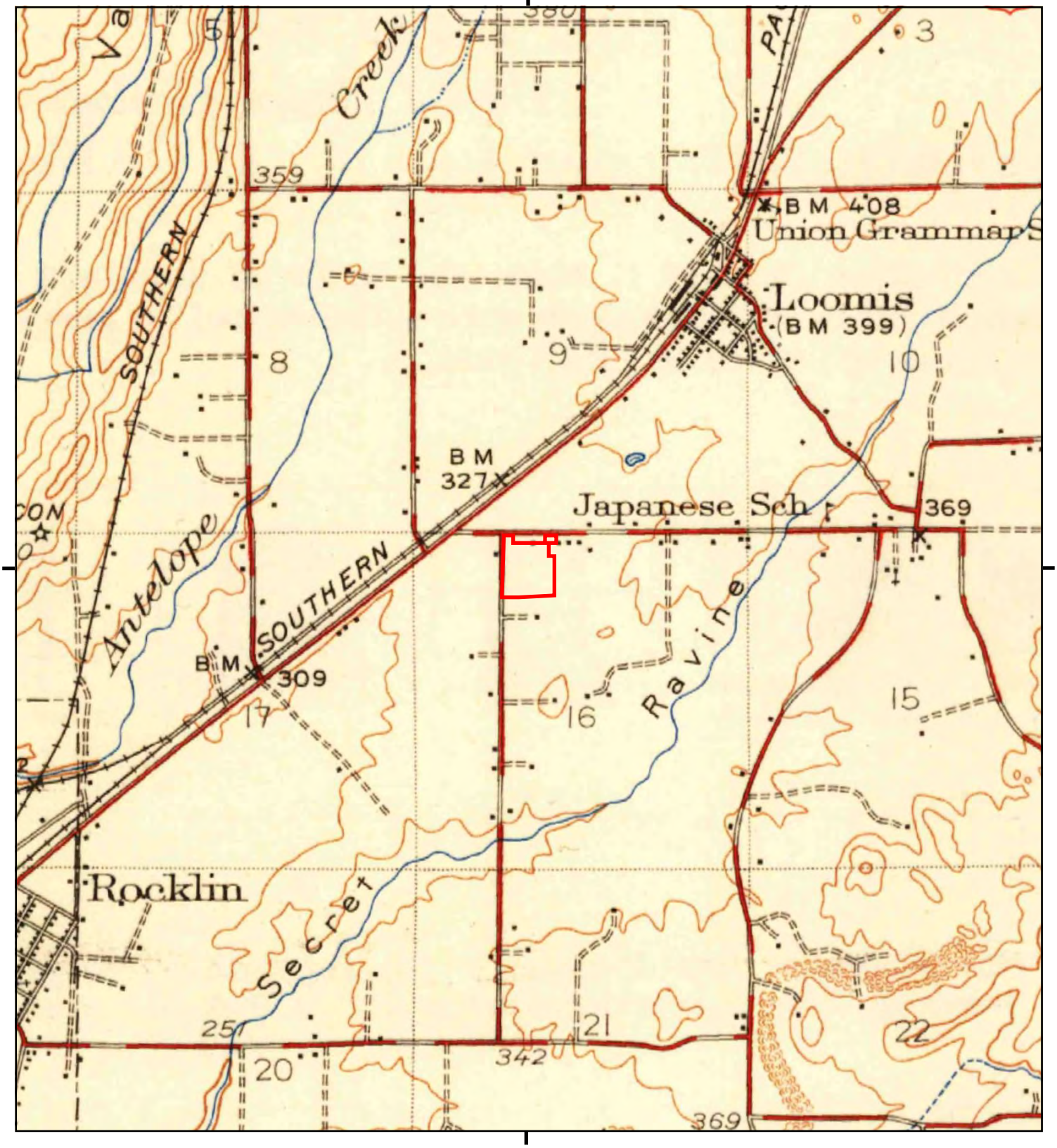
TP, Rocklin, 1954, 7.5-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1944



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

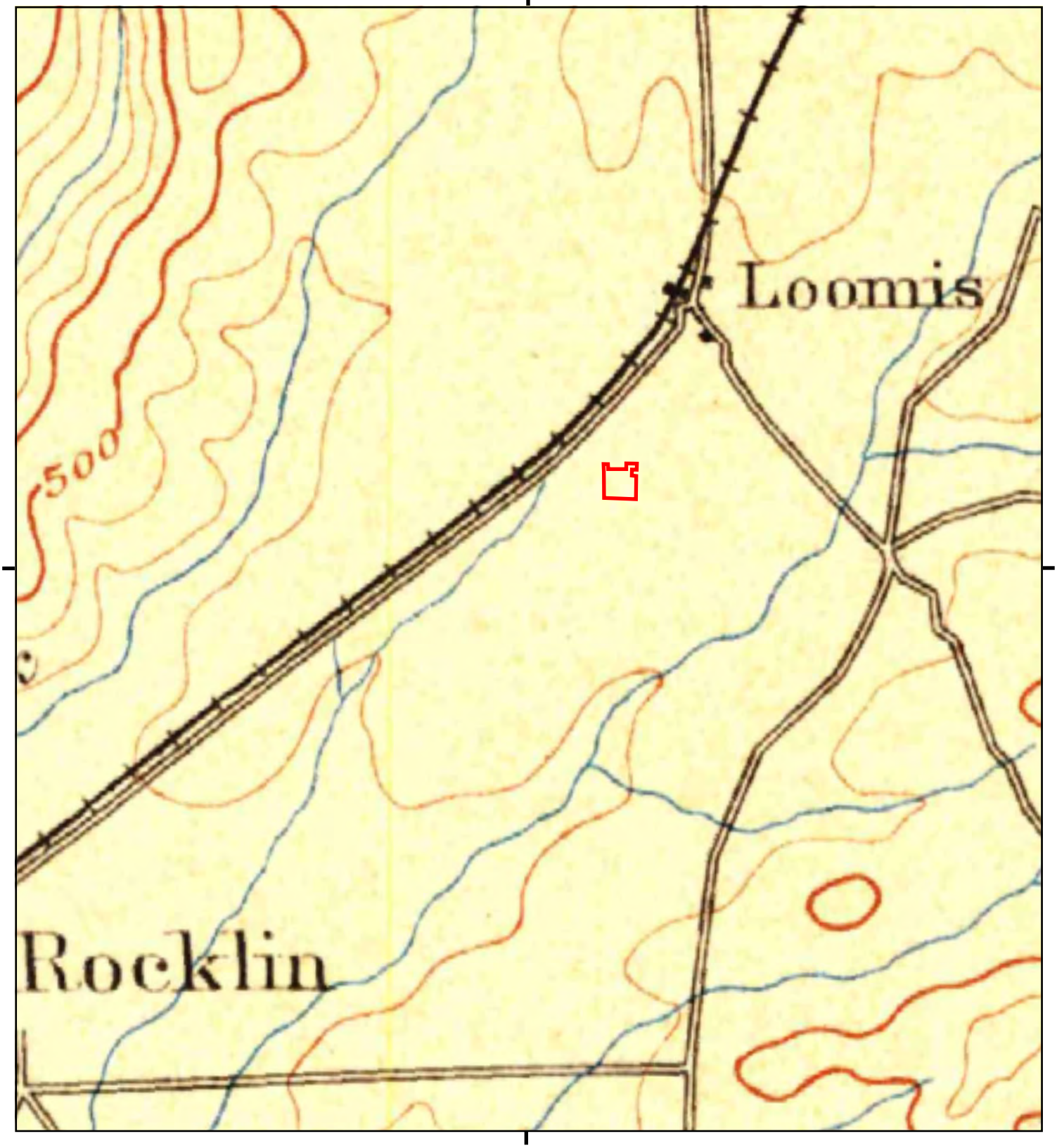
TP, Auburn, 1944, 15-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1893



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

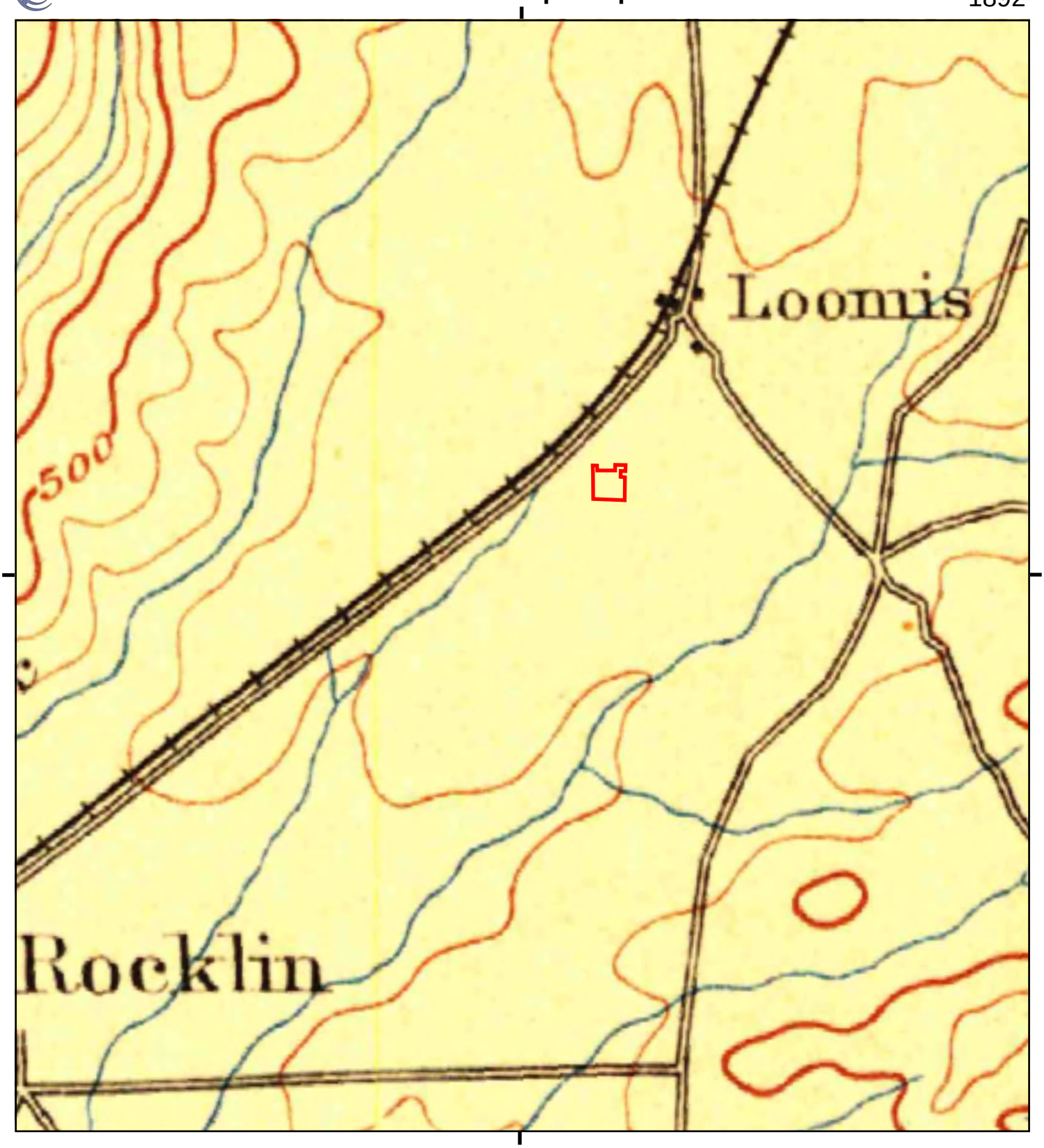
TP, Sacramento, 1893, 30-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1892



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

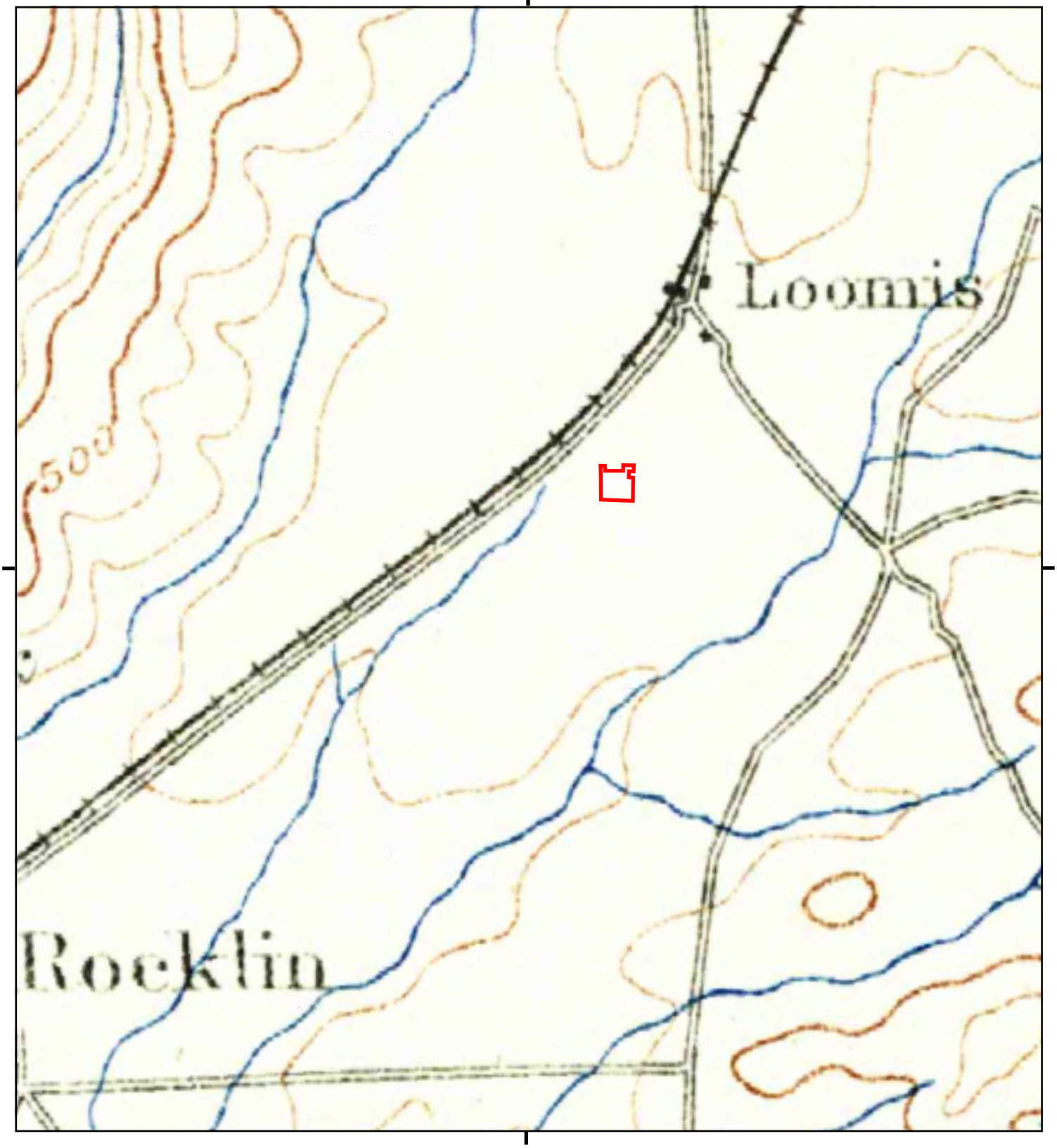
TP, Sacramento, 1892, 30-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

Historical Topo Map

1891



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sacramento, 1891, 30-minute

SITE NAME: SEC Brace Rd and Sierra College Blvd
ADDRESS: SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650
CLIENT: Kleinfelder, Inc.

N

SEC Brace Rd and Sierra College Blvd

SEC Brace Rd and Sierra College Blvd
Loomis, CA 95650

Inquiry Number: 4722099.8
September 08, 2016

EDR Building Permit Report

Target Property and Adjoining Properties

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Building Permit Report: Search Documentation

9/08/16

Site Name:
SEC Brace Rd and
SEC Brace Rd and
Loomis, CA 95650

EDR Inquiry # 4722099.8

Client Name:
Kleinfelder, Inc.
2 Ada, Suite 250
Irvine, CA 92618-0000

Contact: Karin Hagan

Search Documentation

DATA GAP

The complete collection of Building Permit data available to EDR has been searched, and as of 9/08/16, EDR does not have access to building permits in the city where your target property is located (Loomis, CA).

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EDR BUILDING PERMIT REPORT

About This Report

The EDR Building Permit Report provides a practical and efficient method to search building department records for indications of environmental conditions. Generated via a search of municipal building permit records gathered from more than 1,600 cities nationwide, this report will assist you in meeting the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

Building permit data can be used to identify current and/or former operations and structures/features of environmental concern. The data can provide information on a target property and adjoining properties such as the presence of underground storage tanks, pump islands, sumps, drywells, etc., as well as information regarding water, sewer, natural gas, electrical connection dates, and current/former septic tanks.

ASTM and EPA Requirements

ASTM E 1527-13 lists building department records as a "standard historical source," as detailed in § 8.3.4.7: "Building Department Records - The term building department records means those records of the local government in which the property is located indicating permission of the local government to construct, alter, or demolish improvements on the property." ASTM also states that "Uses in the area surrounding the property shall be identified in the report, but this task is required only to the extent that this information is revealed in the course of researching the property itself."

EPA's Standards and Practices for All Appropriate Inquires (AAI) states: "§312.24: Reviews of historical sources of information. (a) Historical documents and records must be reviewed for the purposes of achieving the objectives and performance factors of §312.20(e) and (f). Historical documents and records may include, but are not limited to, aerial photographs, fire insurance maps, building department records, chain of title documents, and land use records."

Methodology

EDR has developed the EDR Building Permit Report through our partnership with BuildFax, the nation's largest repository of building department records. BuildFax collects, updates, and manages building department records from local municipal governments. The database now includes 30 million permits, on more than 10 million properties across 1,600 cities in the United States.

The EDR Building Permit Report comprises local municipal building permit records, gathered directly from local jurisdictions, including both target property and adjoining properties. Years of coverage vary by municipality. Data reported includes (where available): date of permit, permit type, permit number, status, valuation, contractor company, contractor name, and description.

Incoming permit data is checked at seven stages in a regimented quality control process, from initial data source interview, to data preparation, through final auditing. To ensure the building department is accurate, each of the seven quality control stages contains, on average, 15 additional quality checks, resulting in a process of approximately 105 quality control "touch points."

For more information about the EDR Building Permit Report, please contact your EDR Account Executive at (800) 352-0050.

EDR® Environmental Data Resources Inc

BUILD FAX® PROPERTY HISTORY

APPENDIX E
RINCON CONSULTANTS INC. REPORT

Rincon Consultants, Inc.
1530 Monterey Street, Suite D
San Luis Obispo, California 93401

805 547 0900
FAX 547 0901

info@rinconconsultants.com
www.rinconconsultants.com

October 10, 2016
Rincon Project No. 16-03270

Margaret R. Carroll,
Project Professional
Kleinfelder
2 Ada, Suite 250
Irvine, CA 92618
Via e-mail: MCarroll@kleinfelder.com

Subject: Biological Resources Constraints Analysis for APNs 045-042-035-000, 045-042-034-000, 045-042-037-000 and 045-042-036-000 in the City of Loomis, Placer County, California

Dear Ms. Carroll:

Rincon Consultants, Inc. (Rincon) is pleased to submit to Kleinfelder this biological resources constraints analysis for the approximately 17-acre property located at the corner of Sierra College Boulevard and Brace Road in the City of Loomis, Placer County, California (Assessor's Parcel Numbers [APNs]: 045-042-035-000, 045-042-034-000, 045-042-037-000 and 045-042-036-000). This report documents the existing conditions of the proposed development area within these parcels (hereafter known as the "project site"), identifies sensitive biological resources that represent potential constraints to development of the project, and provides recommendations to address any potential constraints associated with such resources.

PROJECT LOCATION AND DESCRIPTION

The project site is located on the southeast corner of Sierra College Boulevard and Brace Road in the Town of Loomis, Placer County, California (Figure 1). A small portion of the project site includes a proposed driveway that is south of the Town limits, within Placer County. The site is approximately one quarter-mile north of Interstate 80 and about 25 miles northeast of the City of Sacramento. The parcel lies within the United States Geological Survey (USGS), *Rocklin, California* quadrangle (approximate center coordinates 38.809060°N, 121.204165°W, WGS 84) and within the Secret Ravine watershed (Hydrologic Unit Code Number 180201110101 – U.S. EPA, 2016) within the Dry Creek basin. Folsom Lake occurs about six miles to the southeast.

Land uses surrounding the project site consist of single residence homes and multiple residence apartments, commercial development, and undeveloped open space with vegetation communities similar to that which occurs on the project site (Photographs 1 and 2). The project site is bordered on the western side by a major surface street, Sierra College Boulevard (Photograph 3). The project site consists of oak woodland savannah, with groundcover

understory dominated by non-native grasses (Photographs 4 and 5). Open areas between trees are dominated by non-native annual grasses and some riparian vegetation occurs at the mouth of two culverts allowing water to drain from the project site under Sierra College Boulevard.

METHODOLOGY

This biological constraints analysis provides a desktop review and field reconnaissance survey to document the biological conditions of the project site and to provide information on the potential constrains to development of the project due to the presence of sensitive biological resources. Information on biological resources was compiled from a variety of publicly available sources including:

- Aerial maps,
- California Natural Diversity Database (CNDDB) (CDFW 2016a),
- California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (CNPS 2016),
- Biogeographic Information and Observation System (BIOS) (CDFW 2016b),
- Special Animals List (CDFW 2016c),
- Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2016d)
- U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal (USFWS 2016a),
- USFWS Information for Planning and Conservation (IPaC) (USFWS 2016b),
- USFWS National Wetland Inventory (NWI) (USFWS 2016c),
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) (USGS 2016), and
- Placer County online GIS data.

Finally, a review of the publicly available California Habitat Connectivity Project (CHCP) data, available as GIS layers in BIOS (CDFW 2016b), was conducted to determine if the study area overlays any potential wildlife movement corridors. The sources outlined above provide a fairly coarse desk top assessment of the biological conditions of the study area consistent with the high-level evaluation of potential constraints to development from sensitive biological resources.

Mr. Eric Schaad, Rincon Senior Biologist, conducted a reconnaissance-level field survey on September 19, 2016, between the hours of 1000 and 1130. Average temperatures were approximately 89 to 92 degrees Fahrenheit (˚F), with less than ten percent cloud cover and winds of zero to two miles per hour. The purpose of the reconnaissance-level field survey was to document existing site conditions, and to evaluate the potential for the presence of sensitive plant communities, special status plant species, special status wildlife species, habitat for nesting birds, jurisdictional wetlands or other waters, riparian habitat, and other biological conditions that may present a constraint on the project. The field survey included visual inspection of the entire project site, during which Mr. Schaad recorded general site conditions and biological resources encountered.

The potential presence of special status species is based on the literature review and field

survey, which are intended to assess general habitat suitability within the project site only. Definitive surveys to confirm the presence or absence of special status species were not performed and are not included in this analysis. Definitive surveys for special status plant and wildlife species generally require specific survey protocols, extensive field survey time, and are required to be conducted at specific time periods. The findings and opinions included in this report are based exclusively on the above methodology.

EXISTING SITE CONDITIONS

Vegetation Communities and General Land Cover Types

The project site occurs in a region that consists of a patchwork of open, undeveloped space interspersed with urban and residential development. One sensitive vegetation community, Northern Volcanic Mudflow Vernal Pool (Holland code: 44132), is reported as occurring within two miles of the project site (CDFW 2016a); however, no evidence of this community type was detected during the reconnaissance survey. Evidence of regular disking is apparent throughout the project site and the majority of herbaceous vegetation on site is ruderal regrowth (Photograph 6). The project site generally consists of oak woodland savannah dominated by oak trees and non-native grasses and weedy forbs. In some instances, oak woodlands are considered sensitive vegetation communities and require additional impact avoidance and/or mitigation considerations. Trees occurring on the project site are a mix of old trees and young saplings. It appears disking was conducted in a manner that avoided damage to trees by avoiding root crowns. Tree species identified on site include:

- California foothill pine (*Pinus sabiniana*)
- California white oak (*Quercus lobata*)
- Interior live oak (*Quercus wislizeni*)
- Italian cypress (*Cupressus sempervirens*)
- White willow (*Salix alba*)
- Freemont cottonwood (*Populus fremontii*)

Grasses and forbs that were identifiable during the reconnaissance level survey consisted of bromes (*Bromus* spp.), wild oat (*Avena* sp.), mustard (*Brassica* sp.), and a single foothill poppy (*Eschscholzia caespitosa*). In general, given the seasonal timing of the survey, grasses and forbs were too dried and dead to be identifiable with certainty (note understory vegetation in photographs), and additional herbaceous species are likely present.

Potentially Jurisdictional Features

No wetlands or waters are identified to occur on the project site according to federal agency databases (USFWS 2016; USGS 2016). Topography varies by less than 15 feet throughout the project site with the lowest areas lying in the center and along on the southern edge of the project site. A low-lying swale runs through the center of the project site; however, no defined channel is currently apparent due to disking and no evidence of water flow was visible. Given surrounding development, no upstream channel exists and the project site could only receive

runoff flow from the streets of the adjacent residential neighborhood to the east. An outflow culvert allows flow off-site to the west under Sierra College Boulevard (Photograph 7).

A second channel occurs along the southern edge of the project site. This channel appears to have been created along with the commercial development adjacent to the south and provides drainage of runoff (Photograph 8). An outflow culvert also exists for this channel on the west side of the project site and running under Sierra College Boulevard. The culver is completely overgrown with vegetation and covered by a buildup of soil and debris. Some vegetation consistent with riparian vegetation community, namely, Freemont cottonwood and white willow, was identified in the southwest of the project site; however, its presence is most likely due to occasional runoff water from the adjacent commercial property and not necessarily the presence of riparian forest.

The region in which the project site occurs is known to support vernal pools (CDFW 2016a; USFWS 2016b). Further analysis is needed to determine if the project site could support vernal pools and vernal pool dependent species. A more detailed study of the soils and topography would be necessary to confirm this conclusion.

Wildlife Movement Corridors

The California Essential Habitat Connectivity project has not identified any wildlife movement corridors to occur on or in the vicinity of the project site (CDFW 2016b). Natural Landscape Blocks and Essential Connectivity Areas are identified well to the east and west, but are outside of the range of any potential project impacts. No Critical Habitat is present on the project site (USFWS 2016a, b)

Special Status Species and Migratory and Nesting Birds

The natural range of special status species of State and federal concern overlaps the region of the study area. Resource agency databases report 31 special status plant species and 12 special status wildlife species with the potential to occur on or within two miles of the project site (CDFW 2016a; CNPS 2016; USFWS 2016b). Of these special status species, nine are State and/or federally listed, including but not limited to, vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), California red-legged frog (*Rana draytonii*), and giant garter snake (*Thamnophis gigas*). Non-listed special status species such as purple martin (*Progne subis*), and white-tailed kite (*Elanus leucurus*) are also reported from the vicinity.

Migratory birds, covered under the Migratory Bird Treaty Act (MBTA), are known to occur and nest in the region of the study area. During the reconnaissance –level survey, a red-shouldered hawk (*Buteo lineatus*) was observed alighting in an oak tree in the center of the project site. Acorn woodpeckers (*Melanerpes formicivorus*) were also observed in abundance. One single, cup-style, stick nest consistent with small raptor species was observed in a large oak tree in the center of the project site (see Figure 1). Suitable nesting habitat is present for a variety of native birds.

REGULATORY SETTING

State and federal resource agencies regulate sensitive biological and waters resources through various laws, policies, and acts. The following is a list of the primary regulations governing impacts to sensitive biological resources that could occur within the study area:

- National Environmental Policy Act (42 U.S. Code [USC], § 4321 et seq.)
- Federal Endangered Species Act (16 USC, § 1531 - 1544)
- Migratory Bird Treaty Act (16 USC § 703 - 711)
- Federal Clean Water Act (33 USC § 1251 - 1376)
- California Environmental Quality Act (Title 14, CA Code of Regulations [CCR] § 753)
- California Endangered Species Act (Fish and Game Code [FGC] § 2050 et seq.)
- Porter-Cologne Water Quality Control Act (Water Code Division 7 and Related Sections)
- Fully Protected Species (FGC § 3511; 4700; 5050; 5515)
- Raptors, migratory birds, and non-game birds (FGC § 3503, 3503.5, 3513, 3800)
- Lake and Streambed Alteration Agreement (LSAA) (FGC § 1600 - 1616)
- Native Plant Protection Act (FGC § 1900 – 1913)

POTENTIAL CONSTRAINTS

Potential Impacts to Special Status Species, and Migratory and Nesting Birds

All 31 of the special status plant species identified from within two miles of the project site have a moderate to high potential to occur, although regular disking that occurs on the site greatly reduces the likelihood that any of these plant species are or will become present. Focused protocol botanical surveys, conducted during the appropriate blooming period, would be necessary to determine presence or absence of plant species with any certainty.

Twelve special status wildlife species are identified from within two miles of the project site. Of these 12 species, only purple martin and white-tailed kite have a moderate to high potential for occurrence based on current site conditions. Further analysis is needed to determine if the project site could support vernal pools and if, therefore, any vernal pool dependent species may potentially occur.

The presence of numerous, large trees presents a high possibility for nesting birds to become present on the project site during the nesting season, generally February through August. Any cutting of trees and clearing of vegetation could impact nesting birds. Prior to any tree cutting or vegetation clearing, a nesting bird survey should be conducted by a qualified biologist experienced in bird species identification and behavior to ensure nesting birds are not present.

Development of the project site generally presents a very low risk to many of the special status species known to occur in the region of the project site due to the disturbed condition of the ground and herbaceous vegetation. The site does present a high potential for nesting birds to be present. If special status species become present in areas proposed for ground disturbance or construction, they could be killed, injured, or indirectly impacted through habitat modification

as a result of project activities. Pre-construction biological surveys, and possibly focused protocol surveys, and the completion of a full biological resources assessment would be necessary to determine the potential for these species to occur within the study area and to evaluate the extent of potential impacts to these species. Recommendations for species- and project-specific mitigation would be based on the results of further analyses.

Potential Impacts to Sensitive Natural Communities

Based on review of aerial imagery, available mapping data, and the reconnaissance-level survey, oak woodland is the only potential sensitive natural communities occurring on the project site. A more detailed study is necessary to determine if soil, topographic, and hydrologic conditions exist that could support vernal pools. Based on the current analysis, no impacts to Sensitive Natural Communities are anticipated to occur as a result of development of the project. If determined to occur thought further analysis, any loss of Sensitive Natural Communities may need to be mitigated through restoration of vegetation communities on or off site, or through acquisition of lands that possess similar or better quality vegetation communities to be preserved in perpetuity.

Potential Impacts to Jurisdictional Waters and Streambeds

Based on review of aerial imagery, online data, and the reconnaissance survey, regulated aquatic resources subject to the permitting authority of the United States Army Corps of Engineers (USACE) and/or the Regional Water Quality Control Board (RWQCB) may occur on the project site. Surface wetland or water features, including riparian vegetation community, subject to the authority of the CDFW may also be present. More detailed analysis is needed to make a determination of potential agency jurisdiction over the low-lying areas and associated vegetation occurring on the project site. Agency jurisdiction is dependent on a number of physical factors, and a formal jurisdictional delineation is recommended. Preparation of a jurisdictional delineation report followed by consultation with the regulatory agencies is necessary to obtain a determination of no jurisdiction. Based on the findings of the recommended delineation, permitting for impacts to wetlands and waters may be necessary through FGC Section 1602, Clean Water Act sections 401 and 404, and/or the Porter-Cologne Water Quality Control Act.

Potential Impacts to Wildlife Movement and Habitat Connectivity

As discussed above, the study area does not lie within any identified Essential Connectivity Area of Natural Landscape Block. Development of the project is not likely to result in the disruption of wildlife movement. Existing residential and commercial development are present on two sides of the site, with I-80 less than 1000 feet to the southeast and a major roadway to the west. These existing developments and transportation features already greatly restrict movement of wildlife to and through the site. Project design measures to enhance wildlife movement around the project may be recommended and could potentially be required by State and federal agencies, if permits or take authorizations are required.

Consistency with Local Biological Policies and Ordinances

The Placer County Tree Preservation Ordinance (Placer County Code, Article 12.16) restricts the cutting of native oak and other trees. Coordination and cooperation with the County may be

required and permits for tree removal may need to be obtained. The Town of Loomis has a Tree Conservation Ordinance (Ordinance No. 252) that restricts the cutting of protected trees or any other activity that could result in the long-term, permanent harm of a protected tree without a permit issued by the Town Manager. Project development activities would need to be reviewed to ensure that they are not in conflict with tree preservation ordinances. No inconsistencies with applicable policies protecting biological resources have been identified.

Consistency with Habitat Conservation Plans

A federal Section 10 habitat conservation plan (HCP) and State Natural Communities Conservation Plan (NCCP) is in development for Placer County and covers the area encompassed by the project site. Known as the Placer County Conservation Plan (PCCP), the goal of the plan is to balance development in Placer County with preservation of open, natural space. A detailed review the PCCP should be conducted to ensure that development of the project is not in conflict with future goals and objectives outlined in the plan.

CONCLUSIONS

The purpose of this report is to provide a general perspective on potential biological constrains to the development of the Loomis Costco project. The approximately 17-acre project site consists of oak woodland savanna dominated by California white oak, interior live oak, and non-native grasses and forbs. Some riparian vegetation was observed where two low-lying swales occur on site and lead to drainage culverts that pass under Sierra College Boulevard. The site has been disked and herbaceous vegetation is primary ruderal. No sign of special status wildlife was present, however, one nest consistent with small raptor species was observed toward the top of an oak tree. A red-shouldered hawk was observed landing in an oak tree during the reconnaissance survey and the site provides ample opportunity for nesting birds. The potential exists for the project to result in impacts to special status plants, nesting birds, and wetlands and waters. Based on existing site conditions, Rincon recommends further analysis during appropriate seasonal timing to conduct botanical surveys, nesting bird surveys, and a jurisdictional delineation.

Sincerely,
RINCON CONSULTANTS, INC.

Eric W. Schaad
Senior Biologist

Colby J. Boggs, MS
Principal / Senior Ecologist

Attachments:

1. *References*
2. *Figure 1 – Project Site and Biological Resources*
3. *Photoplates*

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Project Site and Biological Resources

Figure 1

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SITE PHOTOGRAPHS

Photograph 1: Small apartment complex to the north of the Project site. View facing north.

Photograph 2: Open space with commercial development in background, to the south of the Project site. View facing south.

Photograph 3: Sierra College Boulevard on the west side of the Project site with commercial development in background to the top right. View facing northwest.

Photograph 4: View of Project site facing northeast showing oak woodland savannah.

Photograph 5: View of Project site facing southwest showing oak woodland savannah.

Photograph 6: View of Project site facing west showing disking earth and ruderal vegetation regrowth.

Photograph 7: Culvert from swale in center of Project site allowing flow of water off the Project site to the west under Sierra College Blvd.

Photograph 8: Channel on south side of Project site. View facing west.

Phase II Environmental Site Assessment

March 19, 2018
Kleinfelder Project No.: 20172062.001A

Costco Wholesale
9 Corporate Park, Suite 230
Irvine, California 92606

Attention: Mr. Michael Okuma

SUBJECT: Supplemental Phase II Environmental Site Assessment
Proposed Costco Wholesale Warehouse and Fuel Facility
Southeast Corner of Brace Road and Sierra College Boulevard
Loomis, Placer County, California
CW#: 16-0132

Dear Mr. Okuma:

Kleinfelder is pleased to provide Costco Wholesale Corporation (Costco) this report of a Supplemental Phase II Environmental Site Assessment (ESA) of the site of a proposed Costco Wholesale warehouse and fuel facility, located at the southeast corner of Brace Road and Sierra College Boulevard (the Site) in the City in Loomis, Placer County, California (Figure 1). The Supplemental Phase II ESA was performed to further assess concentrations of lead and arsenic in soils, and diesel-range extractable petroleum hydrocarbons (TPH-d) in groundwater, which were previously identified in samples collected by Kleinfelder during April and May 2017.

In summary, the Supplemental Phase II ESA results indicate elevated arsenic and lead concentrations are present in shallow soil across much of the Site, and may have resulted from application of lead arsenate pesticide during former Site use as an orchard. Kleinfelder recommends coordination with a regulatory agency to develop a mitigation strategy appropriate for intended Site use. Groundwater sampling results indicate diesel-range TPH was not present at a concentration at or above its laboratory reporting limit, so no further groundwater assessment is recommended.

The following sections provide a Site description and background information and discuss the Supplemental Phase II ESA methodology and analytical results of its soil and groundwater samples, which were collected at the Site by Kleinfelder during December 2017 and January 2018.

SITE DESCRIPTION AND BACKGROUND INFORMATION

The Site consists of 17.2-acres of undeveloped land located southeast of the intersection of Brace Road and Sierra College Boulevard in the City of Loomis, California. Costco is planning to construct a Costco Warehouse with fuel facility at the Site, and initially requested Kleinfelder to perform a Phase I ESA of the Site. Kleinfelder performed the Phase I ESA, which identified recognized environmental conditions including former use of the Site as an orchard and the presence of a retail gasoline station on the property adjoining to the south of the Site. Costco

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then requested Kleinfelder to perform a Limited Phase II ESA of the Site to address findings of the Phase I ESA and collect baseline environmental data before Site redevelopment.

The Limited Phase II ESA field activities occurred in April and May, 2017, and are discussed in further detail in Kleinfelder's report issued to Costco during August 2017.[1] The Phase II ESA included collection of soil, groundwater and soil vapor samples that were analyzed by a subcontracted laboratory. Kleinfelder compared the soil analytical results to soil "Tier 1" Environmental Screening Levels (ESLs) issued by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). The "Tier 1" ESLs were designed to protect properties with unrestricted land and water use, addressing media including soil, groundwater, and soil vapor, along with a range of concerns including direct exposure human health risks, impact to drinking water, vapor intrusion, and impact to aquatic life. Use of the Tier 1 ESLs applies the most conservative ESL for each considered constituent of concern. Soil analytical results were also compared to human-health risk-based screening levels for residential and commercial/industrial soil recommended in the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), Office of Human and Ecological Risk (HERO) Human Health Risk Assessment (HHRA) Note Number (No.) 3, for analytes having such values. For those analytes without published DTSC-SLs, Kleinfelder compared the measured concentrations to the US EPA's Regional Screening Levels (RSLs) for residential and industrial soil (for Hazard Quotient of 1.0). Groundwater analytical results were compared to groundwater Tier 1 ESLs. A summary of the findings of the Limited Phase II ESA follows:

- Organochlorine pesticides (OCPs) were either not present in the soil samples at concentrations at or above laboratory reporting limits or their measured concentrations did not exceed respective soil ESLs, DTSC-SLs, and RSLs (as applicable).
- TPH and VOCs were either not present in the soil samples at concentrations at or above laboratory reporting limits or their measured concentrations did not exceed respective soil ESLs, DTSC-SLs, and RSLs (as applicable).
- Arsenic was present in many Site soil samples, with the concentrations of shallow soil from several locations exceeding the soil "Tier 1" arsenic ESL and the arsenic DTSC-SLs for residential and commercial/industrial soil. It has been acknowledged by regulatory agencies, including the DTSC, that background concentrations of arsenic in California soils commonly exceed established arsenic human-health risk-based screening levels. The arsenic concentrations of surface and near-surface soil samples collected at the Site are most variable, whereas the concentrations tend to be generally lower in deeper soil samples. Maximum arsenic concentrations did not exceed the arsenic Total Threshold Limit Concentration (TTLC) that is one characteristic of a California-hazardous waste. Further vertical and horizontal assessment for arsenic in soil was recommended.
- Lead concentrations in two shallow soil samples exceeded the Tier 1 lead ESL and the lead residential soil DTSC-SL; however, they did not exceed the DTSC-SL for commercial/industrial soil. Four lead concentrations also exceeded 10 times the lead Soluble Threshold Limit Concentration (STLC) of 5 mg/L. One of these samples was further analyzed for soluble lead using the waste extraction test (WET) procedure

[1] Kleinfelder, 2017. Letter report with subject "Limited Phase II Environmental Site Assessment, Proposed Costco Wholesale Warehouse and Fuel Facility, Southeast Corner of Brace Road and Sierra College Boulevard, Loomis, Placer County, California, CW#: 16-0132." August 30.

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discussed in California Code of Regulations (CCR) Title 22 Appendix II. The result did not exceed the STLC.

- Except for cobalt, concentrations of the various other metals present in the soil samples were below their respective human health risk-based screening levels. One soil sample, collected from 7 feet below ground surface (bgs), contained a cobalt concentration exceeding the cobalt human health risk-based screening levels. The chromium concentration of the same sample exceeded 10 times the chromium STLC. The elevated cobalt and chromium concentrations in this sample may be from native minerals present in the Site region that are associated with the decomposed granite beneath the Site vicinity. Reported concentrations of each metal present (including arsenic) were below their respective threshold values for Federal and California hazardous waste.
- Groundwater analytical results indicated TPH-d was present at a concentration above the diesel ESL.
- VOC groundwater analytical results indicated VOCs were not present in the samples at concentrations at or above their respective reporting limit.
- Soil vapor analytical results indicated VOCs were not present in the samples at concentrations at or above their respective reporting limits.

As requested by Costco, Kleinfelder has performed this Supplemental Phase II Environmental Site Assessment to further assess concentrations of lead and arsenic in soil, and TPH-d in groundwater. The assessment is discussed in detail in the following section.

SUPPLEMENTAL PHASE II ESA SCOPE OF SERVICES

Health and Safety Plan Preparation

Prior to initiation of field activities, Kleinfelder updated its Site-Specific Health and Safety Plan (HSP) containing information regarding potential chemical and physical hazards, monitoring equipment, and contingency plans for emergencies during the field activities. The HSP was based on the general knowledge of chemical characteristics of materials reportedly present on the Site. Based on the proposed field services and probable environmental conditions, it was assumed that Level D Protection (personal protective equipment including gloves, steel-toe rubber boots, hard hat, and eye protection) would be adequate for performing the field activities described herein. An upgrade was not required during the field work.

Permit Procurement

Prior to initiation of field activities, and on Costco's behalf, Kleinfelder obtained the permit required for well installation activities from Placer County Department of Health and Human Services, Environmental Health Services. The well permit (copy attached) was issued on December 7, 2017.

Bore Location Marking and Geophysical Utility Clearance and Survey

Kleinfelder and its utility locating subcontractor, Ground Penetrating Radar Systems, Inc., marked the bore locations and buried utility lines in proximity to them on December 7, 2017. In addition, and as required by State of California law, Underground Service Alert of Northern/Central California and Nevada (USA North) was notified, on December 4, 2017.

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Soil Sampling

The limited soil sampling activities initially included advancement of 35 bores (designated Bores SB-01 through SB-35), each to an approximate total depth of 3 feet bgs, and collecting soil samples from the bores. Based on laboratory results of the collected samples, 23 additional bores (designated Bores SB-36 through SB-60) were proposed, to laterally assess the extent of impact in several areas where elevated lead and arsenic concentrations appeared to be present. Bore advancement and soil sampling activities at these additional locations, each to an approximate total depth of 3.5 feet bgs, were performed on December 7, 8, and 15, 2017, and January 24 and 25, 2018.

Each bore was advanced using a hand auger or direct-push drilling rig. After completion of soil sampling, the bore was backfilled with neat cement grout, and the surface was patched using soil from the immediately surrounding area.

The soil samples were collected from the hand auger bucket, and promptly transferred into laboratory-provided, 4-ounce glass jars. After a jar was filled with soil, it was capped with its lid, labeled with pertinent sampling information, and placed into an ice-chilled cooler for temporary storage until delivered to the analytical laboratory.

Kleinfelder field staff, under the supervision of a State of California-registered Professional Geologist, observed the sampled soils, logged them consistent with Unified Soils Classification System visual-manual methods specified in ASTM International's Designation D 2488, and prepared field lithologic logs of the soils encountered during the drilling activities.

Groundwater Sampling Activities

On December 15, 2017, in an effort to perform "grab" groundwater sampling in the southern portion of the Site where the fuel facility is to be constructed, three bores (designated Bores GW-1 through GW-3) were advanced at the Site using the drilling subcontractor's track-mounted, direct-push drilling rig. Bore GW-1 was advanced to an approximate depth of 18 feet bgs, at which it encountered refusal, and Bores GW-2 and GW-3 encountered refusal at approximately 6 feet bgs. The driller temporarily placed 1-inch diameter polyvinyl chloride (PVC) casing with slotted PVC well screen at the bottom in each bore, and allowed time for groundwater to enter the bore. At the end of the field day, no groundwater was evident. Pursuant to Placer County requirements, the three bores were abandoned by backfilling with cement grout, and each location was capped with soil from the immediately surrounding area.

On January 24, 2018, Kleinfelder returned to the Site with the drilling subcontractor and its track-mounted drilling rig equipped with hollow stem augers, and the rig was used to drill a new bore adjacent to the location of each bore advanced on December 15, 2017. Bore GW-1 was drilled to an approximate depth of 18.5 feet bgs, at which it encountered refusal caused by apparent bedrock. A 2-inch diameter PVC well was constructed in the bore using 5 feet of well screen containing machine-cut, 0.010-wide slots, and blank casing above it. The screen was placed from 18.5 feet to 13.5 feet bgs. Monterey 2/20 sand filter pack was then placed into the annulus around the casing, from the bottom of the bore to approximately 11.5 feet bgs, bentonite chips were placed above that to approximately 9.5 feet bgs, and neat cement grout was placed above that nearly to the ground surface. A 6-inch diameter well vault was placed in cement at the surface, to prevent unauthorized access to the well.

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Bore GW-2 was drilled to a depth of approximately 11 feet bgs, at which it encountered refusal on apparent bedrock. A 2-inch diameter PVC well was constructed in the bore, similar to Well GW-1, except Well GW-2's screen interval is set from approximately 11 feet to 6 feet bgs, the top of its sand filter pack is at approximately 5 feet bgs, and its bentonite chips extend to approximately 4 feet bgs.

Bore GW-3 was drilled to a depth of approximately 10.5 feet bgs, at which it encountered refusal on apparent bedrock. As with the other two bores, a 2-inch diameter PVC well was constructed, except its screen interval is set from approximately 10.5 feet to 5.5 feet bgs, the top of its sand filter pack is at approximately 4.5 feet bgs, and its bentonite chips extend to approximately 3.5 feet bgs.

On January 25, 2018, prior to purging and sampling a given well, the groundwater level in the well and its total depth were gauged, and then the well was developed, purged, and sampled. The groundwater volume purged from each of Wells GW-1 and GW-3 was approximately 5.3 gallons, equivalent to approximately 3.3 saturated well casing volumes for Well GW-1 and 4.7 saturated well casing volumes for Well GW-3. The volume purged from Well GW-2 was approximately 3.2 gallons, equivalent to approximately 2.4 saturated well casing volumes. A few hours after purging, groundwater was sampled using a peristaltic pump. The samples were collected in laboratory-provided containers. Copies of completed Groundwater Sampling Data Sheets documenting the monitoring and purging are attached.

Laboratory Analyses

Soil Samples. The soil samples were submitted to a subcontracted California Environmental Laboratory Accreditation Program-accredited laboratory, California Laboratory Services (CLS), for analysis of arsenic and lead using US EPA Method 6010B. In addition, if a reported concentration of an individual metal in a given sample exceeded 10 times its California Title 22 Soluble Threshold Limit Concentration (STLC), the sample was analyzed for the soluble metal using the California Waste Extraction Test and US EPA Method 6010B. Based on their total lead concentrations, 16 samples were analyzed for soluble lead in this manner.

Groundwater Samples. The three groundwater samples collected from Wells GW-1 through GW-3 were submitted to CLS for analysis of TPH-d using US EPA Method 8015B.

FIELD OBSERVATIONS AND ANALYTICAL RESULTS

Field Observations

Subsurface soil at the Site was observed to consist of silty sand and silty clayey sand, underlain by poorly-graded sand. The soil samples collected emitted no noticeable hydrocarbon or other chemical odor, nor did they contain obvious indications suggestive of potential contamination, such as hydrocarbon like or other chemical-like staining.

Groundwater was not encountered in the shallow bores used for the arsenic and lead sampling, nor in initial Bore GW-1 that was advanced to an approximate depth of 18 feet bgs during the December 15, 2017 "grab" groundwater sampling effort. On January 24, 2018, groundwater was encountered in Bores GW-1, GW-2 and GW-1 at respective depths of 14 feet, 11 feet, and 6 feet bgs. On January 25, 2018, the respective measured groundwater depths in Wells GW-1 through GW-3 (prior to their development, purging, and sampling) were 8.78 feet, 3.25 feet,

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and 3.63 feet below the given well's top-of-casing reference point. In each well, the groundwater surface measured on January 25, 2018 was above the top of its screen interval, by distances ranging from approximately 2 feet to 5 feet depending on the given well.

Soil Sampling Analytical Results

Analytical results of the soil samples are summarized as follows:

- As indicated in Table 1, 91 discrete shallow soil samples (of which 56 were collected from approximately 0.5 foot bgs and 35 from approximately 3 feet bgs) were analyzed for arsenic and lead. Arsenic was present at a concentration at or above its laboratory reporting limit in 67 samples (including 53 samples from 0.5 foot bgs and 14 samples from 3 feet bgs), with reported concentrations ranging from 1.0 mg/kg to 31 mg/kg. Sample SB-09-0.5, collected from an approximate depth of 0.5 foot at Location SB-09, contained the highest reported arsenic concentration.
- Lead was present at a concentration at or above its reporting limit in 74 of the 91 samples (including each sample from 0.5 foot bgs and 18 samples from 3 feet bgs), with reported concentrations ranging from 2.6 mg/kg to 160 mg/kg. Sample SB-09-0.5 also contained the highest reported lead concentration.

CLS's laboratory reports for its soil sample analyses are attached. Kleinfelder's evaluation of the soil analytical results is provided in the subsequent "Evaluation of Analytical Results" section of this report.

Groundwater Sampling Analytical Results

As indicated in Table 2, three groundwater samples, collected from Wells GW-1 through GW-3, were analyzed for TPH-d. The results indicated TPH-d was not present in the samples at concentrations at or above its laboratory reporting limit.

CLS's laboratory report of its groundwater sample analyses is attached. Kleinfelder's evaluation of the groundwater analytical results is provided in the subsequent "Evaluation of Analytical Results" section of this report.

EVALUATION OF ANALYTICAL RESULTS

Soil Sampling Analytical Results Evaluation

To evaluate measured concentrations of arsenic and lead present in the soil samples, they were compared to February 2016 soil "Tier 1" ESLs for arsenic and lead, and to January 2018 lead DTSC-SLs for residential and commercial/industrial soil. Kleinfelder also compared the measured concentrations to the US EPA's June 2017 RSLs for residential and industrial soil (for Hazard Quotient of 1.0). These screening values are included in Table 1.

Also, in consideration of concentration thresholds for California and Federal hazardous waste, reported concentrations of arsenic and lead were compared to its respective CCR Title 22 TTLC value. The reported concentrations were also compared to 10 times the metal's STLC value and 20 times its Federal Toxicity Characteristic Leaching Procedure (TCLP) value. These screening values are included in Table 1.

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As Table 1 indicates, arsenic concentrations ranging from 1.0 mg/kg to 31 mg/kg in 67 soil samples (including 53 soil samples collected at approximately 0.5 foot bgs and 14 soil samples collected at approximately 3 feet bgs) exceed the arsenic "Tier 1" soil ESL (0.067 mg/kg) as well as both the arsenic residential and commercial/industrial soil DTSC-SLs (0.11 mg/kg and 0.36 mg/kg, respectively) and RSL for residential soil (0.68 mg/kg), with the concentrations of several samples also exceeding the RSL for industrial soil (3.0 mg/kg). The samples collected at Location SB-09 contained the highest arsenic concentration reported for both sampling depths. Regulatory agencies including the DTSC and US EPA have acknowledged arsenic background concentrations of soils in California commonly exceed established arsenic human-health risk-based screening levels. It is possible that the arsenic concentrations present in the 0.5-foot and 3-foot bgs soil samples represent Site background concentrations for soil at those depths. The reported arsenic concentrations do not exceed the TTLC threshold for a California hazardous waste, and none warranted testing of the samples for soluble arsenic.

As Table 1 indicates, lead was present at a concentration at or above its reporting limit in 74 of the 91 samples (including each sample from 0.5 foot bgs and 18 samples from 3 feet bgs), with reported concentrations ranging from 2.6 mg/kg to 160 mg/kg. Lead concentrations of 11 shallow soil samples exceed the soil "Tier 1" lead ESL (80 mg/kg) and the lead residential soil DTSC-SL (also 80 mg/kg), but are below the DTSC-SL for commercial/industrial soil of 320 mg/kg. Each reported lead concentration is below the lead RSLs for residential and industrial soil (400 mg/kg and 800 mg/kg, respectively). Lead concentrations of 21 samples exceed 10 times the lead STLC of 5 mg/L. These 21 samples were assessed for soluble lead using the CA WET. The soluble lead result of one sample, SB-09-0.5, was equal to the STLC of 5.0 mg/L. This sample was further analyzed using the TCLP, with the result below the lead TCLP limit (Table 1).

Based on the analytical results summarized above, arsenic and lead are present in shallow soil at the Site at concentrations that exceed their respective soil Tier 1 ESLs and residential soil DTSC-SLs. In addition, arsenic concentrations of many of the samples exceed the DTSC-SL for commercial/industrial soil.

Groundwater Sampling Analytical Results Evaluation

As Table 2 indicates, TPH-d was not present in the groundwater samples from Wells GW-1 through GW-3 at concentrations at or above the laboratory reporting limit. To evaluate the TPH-d reporting limit, it was compared to the SFBRWQCB's February 2016 TPH-d "Tier 1" ESL for groundwater. This screening level is included in Table 2. The laboratory reporting limit is below the ESL.

CONCLUSIONS AND RECOMMENDATIONS

Kleinfelder's evaluations of the analytical results of samples collected during the subject Limited Phase II ESA have revealed the following:

- Arsenic concentrations in shallow soil exceeded the arsenic "Tier 1" soil ESL, the arsenic residential soil DTSC-SL, and the DTSC-SL for commercial/industrial soil. However, it has been acknowledged by regulatory agencies, including the DTSC, that background concentrations of arsenic in soils in California commonly exceed established arsenic human-health risk-based screening levels. Arsenic concentrations do not exceed the TTLC threshold for a California hazardous waste.

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- Lead concentrations in 11 shallow soil samples exceed the “Tier 1” lead ESL (80 mg/kg) and the lead residential soil DTSC-SL (80 mg/kg), although they are below the DTSC-SL for commercial/industrial soil (320 mg/kg). Lead concentrations of 21 soil samples were more than 10 times the lead STLC of 5 mg/L, so these samples were analyzed for soluble lead using the WET. The results of one sample (SB-09-05) was equal to the 5.0-mg/L STLC. The sample was analyzed by the TCLP, the result of which did not exceed the TCLP limit.
- Based on the soil analytical results, Kleinfelder recommends that soil disturbed during Site redevelopment activities be sampled, with the samples to be analyzed for lead and arsenic, to assess appropriateness for reuse of the soil on Site and to establish an analytical waste profile for its off-Site transportation and disposal if it is found not to be suitable for reuse.
- It is possible that some of the elevated arsenic and lead concentrations present in shallow soil across much of the Site resulted from application of lead arsenate pesticides during former use of the Site as an orchard. Kleinfelder recommends coordination with a regulatory agency to develop a mitigation strategy appropriate for the intended Site use.
- The groundwater analytical results indicated diesel-range TPH was not present at a concentration at or above its laboratory reporting limit. No further groundwater assessment is recommended.

LIMITATIONS

Kleinfelder performed this assessment and prepared this report in accordance with generally accepted standards of care that exist in California at this time. This report may be used only by Costco and only for the purposes stated, within a reasonable time from its issuance but in no event later than 5 years from the report’s date. All information gathered by Kleinfelder is considered confidential and will be released only upon written authorization of Costco or as required by law. Non-compliance with any of these requirements by Costco, unless specifically agreed to in advance by Kleinfelder in writing, will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party, but only to the extent of any such non-compliance by Costco. Further limitations applicable hereto may be set forth in Costco’s written agreement with Kleinfelder covering the work performed herein.

Kleinfelder’s professional opinions and recommendations are based on a limited number of field observations and tests, designed, collected, and performed in accordance with the generally accepted engineering practice that exists at the time. Consequently, no warranty or guarantee, expressed or implied, is intended or made.

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CLOSING REMARKS

Kleinfelder thanks Costco for the opportunity to provide professional environmental services, and looks forward to future work with you on other projects. Please feel free to call Paolo Dizon, Kleinfelder's Project Manager, should you have questions.

Sincerely,

KLEINFELDER, INC.

Sara Boyer
Staff Professional

Herbert (Bert) A. Vogler III, PG
Principal Hydrogeologist

Attachments:
- Figures
  - 1 – Site Location Map
  - 2 – Interpolated Arsenic Concentrations – 0.5-Foot Depth
  - 3 – Interpolated Lead Concentrations – 0.5-Foot Depth
- Tables
  - 1 – Soil Analytical Results – Arsenic and Lead
  - 2 – Groundwater Analytical Results – TPH-d
- Well Permit
- Bore Logs
- Groundwater Sampling Data Sheets
- Laboratory Analytical Reports

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FIGURES

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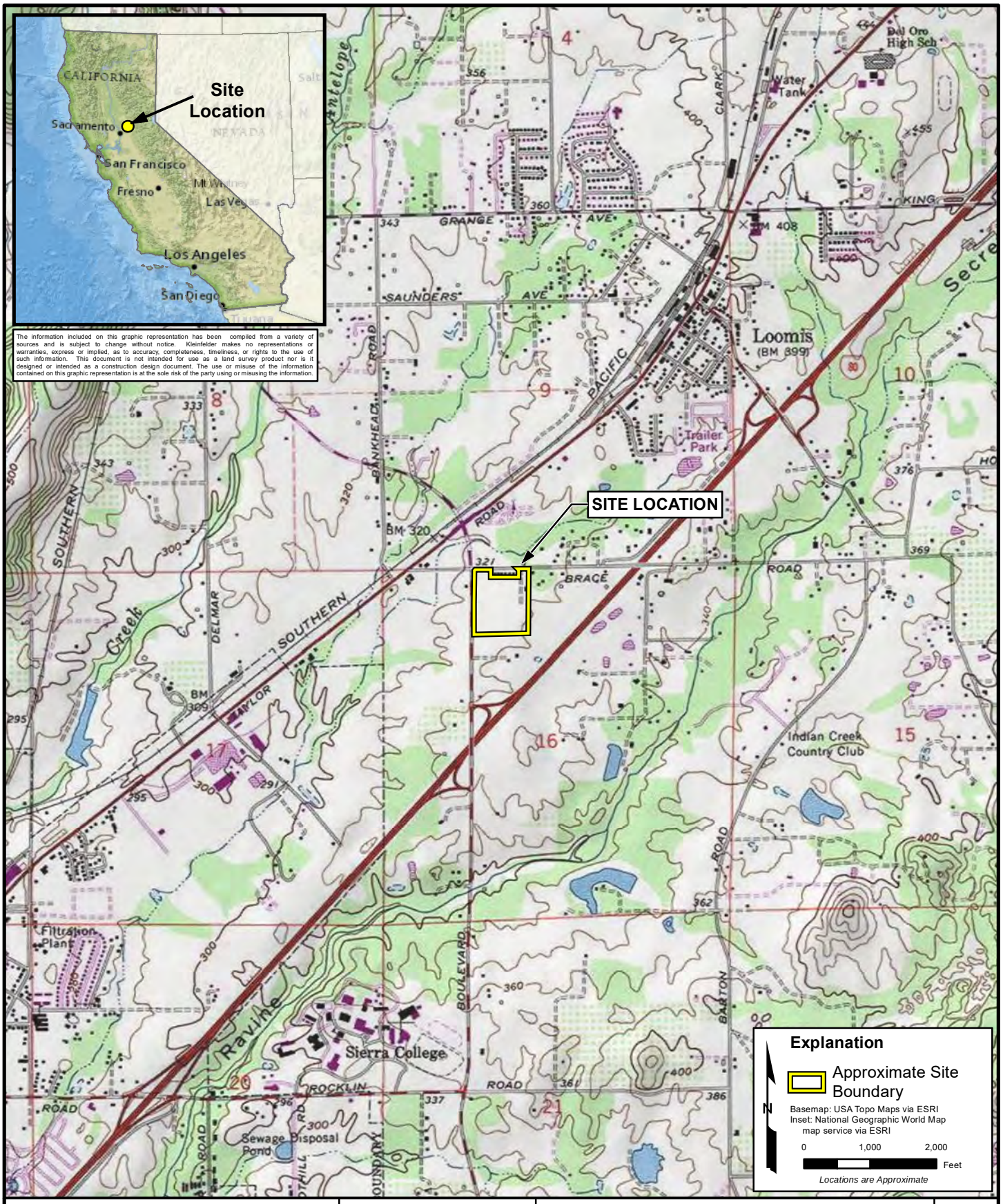

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FILE NAME:	P2_Figure1.mxd

SITE LOCATION MAP

Limited Phase II Environmental Site Assessment Report
Proposed Costco Wholesale Warehouse and Fuel Facility
Southeast Corner of Brace Road and Sierra College Boulevard
Loomis, Placer County, California

FIGURE
1

Source: DB+A, Costco Loomis Preliminary Concept Site Plan 1.1, 11/29/2016.
Aerial: ESRI World Imagery, USDA NAIP 2014.

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N

0 75 150 Feet

Locations are Approximate

Explanation

- 0.5-foot deep soil sample analyzed for arsenic
- 12-mg/kg arsenic concentration contour
- other arsenic concentration contour (contour interval = 5 mg/kg)
- monitoring well groundwater sample location

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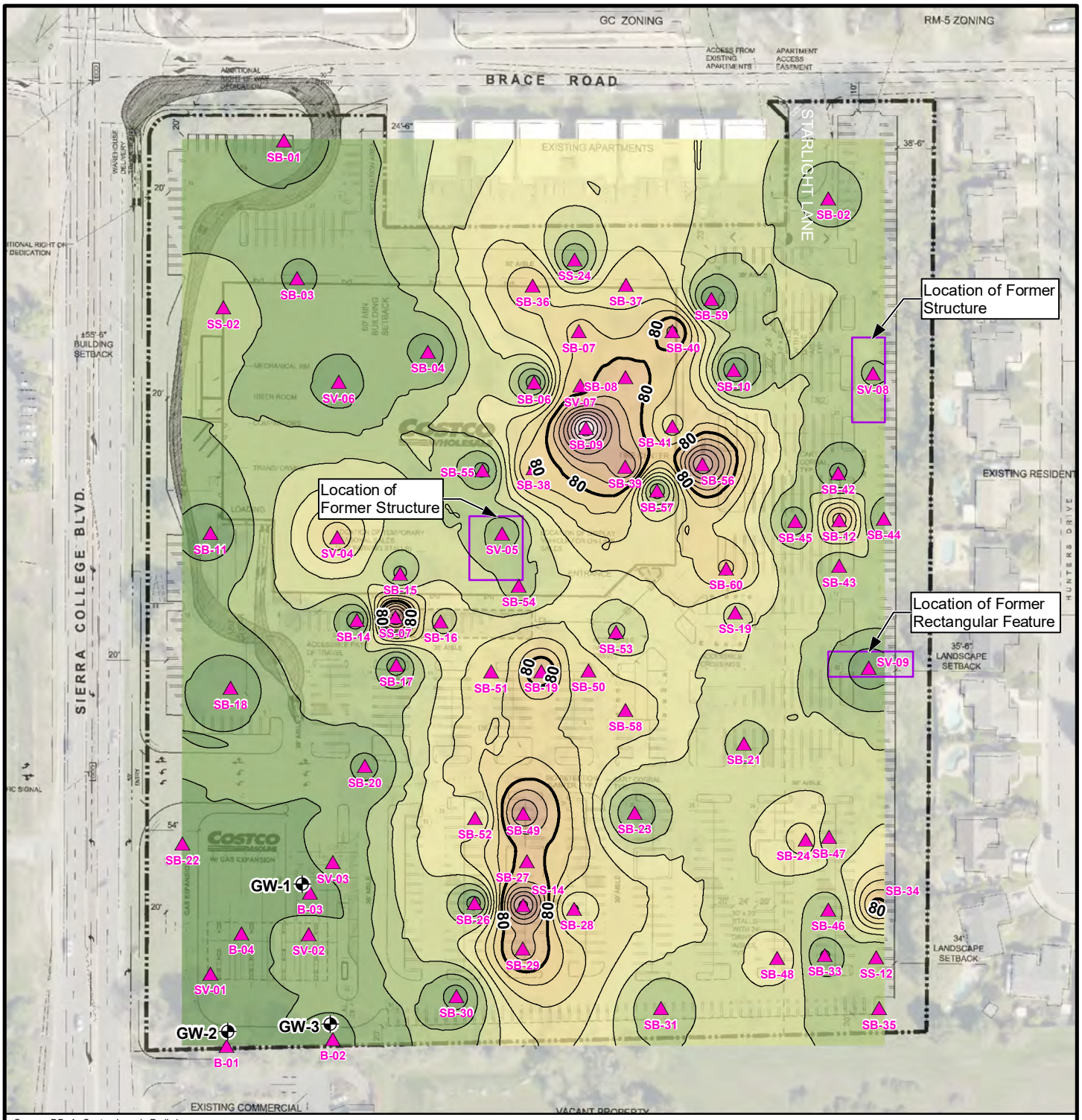
DRAWN BY:	KFH
CHECKED BY:	HAV
FILE NAME:	Fig2_arsenic.mxd

INTERPOLATED ARSENIC CONCENTRATIONS - 0.5-FOOT DEPTH

Supplemental Site Assessment
Proposed Costco Wholesale Warehouse and Fuel Facility
Southeast Corner of Brace Road and Sierra College Boulevard
Loomis, Placer County, California

FIGURE
2



Source: DB+A, Costco Loomis Preliminary Concept Site Plan 1.1, 11/29/2016.
Aerial: ESRI World Imagery, USDA NAIP 2014.

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N

0 75 150 Feet

Locations are Approximate

Explanation

- 0.5-foot deep soil sample analyzed for lead
- 80-mg/kg lead concentration contour
- other lead concentration contour (contour interval = 10 mg/kg)
- monitoring well groundwater sample location

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FILE NAME:	Fig3_lead.mxd

INTERPOLATED SOIL LEAD CONCENTRATIONS - 0.5-FOOT DEPTH

Supplemental Site Assessment
Proposed Costco Wholesale Warehouse and Fuel Facility
Southeast Corner of Brace Road and Sierra College Boulevard
Loomis, Placer County, California

FIGURE
3

TABLES

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TABLE 1
SOIL ANALYTICAL RESULTS – ARSENIC AND LEAD
Proposed Costco Wholesale Warehouse and Fuel Facility
Sierra College Boulevard and Brace Road
Loomis, California

Bore	Sample	Date Sampled	Sample Depth (feet bgs)	TTLC Arsenic (mg/kg) 6010B	STLC Arsenic (mg/L) STLC WET / 6010B	TCLP Arsenic (mg/L) TCLP	TTLC Lead (mg/kg) 6010B	STLC Lead (mg/L) STLC WET / 6010B	TCLP Lead (mg/L) TCLP
SB-01	SB-01-0.5	12/7/2017	0.5	**1.1**	NA	NA	4.6	NA	NA
	SB-01-3	12/7/2017	3.0	ND (<1.0)	NA	NA	2.9	NA	NA
SB-02	SB-02-0.5	12/7/2017	0.5	**2.7**	NA	NA	16	NA	NA
	SB-02-3	12/7/2017	3.0	**3.6**	NA	NA	23	NA	NA
SB-03	SB-03-0.5	12/7/2017	0.5	**1.3**	NA	NA	8.6	NA	NA
	SB-03-3	12/7/2017	3.0	**1.2**	NA	NA	3.3	NA	NA
SB-04	SB-04-0.5	12/7/2017	0.5	**1.3**	NA	NA	4.7	NA	NA
	SB-04-3	12/7/2017	3.0	**1.1**	NA	NA	ND (<2.5)	NA	NA
SB-05	SB-05-3	12/7/2017	3.0	**1.5**	NA	NA	2.9	NA	NA
SB-06	SB-06-0.5	12/7/2017	0.5	ND (<1.0)	NA	NA	4.0	NA	NA
	SB-06-3	12/7/2017	3.0	**1.3**	NA	NA	5.3	NA	NA
SB-07	SB-07-0.5	12/7/2017	0.5	**17**	NA	NA	73	2.2	NA
	SB-07-3	12/7/2017	3.0	**1.5**	NA	NA	3.4	NA	NA
SB-08	SB-08-0.5	12/7/2017	0.5	**24**	NA	NA	**87**	1.6	NA
	SB-08-3	12/7/2017	3.0	**1.2**	NA	NA	2.7	NA	NA
SB-09	SB-09-0.5	12/7/2017	0.5	**31**	NA	NA	**160**	5.0	ND (<0.50)
	SB-09-3	12/7/2017	3.0	**6.3**	NA	NA	5.3	NA	NA
SB-10	SB-10-0.5	12/7/2017	0.5	**1.3**	NA	NA	2.9	NA	NA
	SB-10-3	12/7/2017	3.0	**1.5**	NA	NA	4.4	NA	NA
SB-11	SB-11-0.5	12/7/2017	0.5	**2.1**	NA	NA	5.1	NA	NA
	SB-11-3	12/7/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-12	SB-12-0.5	12/7/2017	0.5	**14**	NA	NA	76	2.1	NA
	SB-12-3	12/7/2017	3.0	**1.2**	NA	NA	ND (<2.5)	NA	NA
SB-13	SB-13-3	12/7/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-14	SB-14-0.5	12/7/2017	0.5	**1.0**	NA	NA	3.5	NA	NA
	SB-14-3	12/7/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-15	SB-15-0.5	12/7/2017	0.5	**1.8**	NA	NA	17	NA	NA
	SB-15-3	12/7/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-16	SB-16-0.5	12/7/2017	0.5	**8.5**	NA	NA	37	NA	NA
	SB-16-3	12/7/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-17	SB-17-0.5	12/7/2017	0.5	**1.1**	NA	NA	4.2	NA	NA
	SB-17-3	12/7/2017	3.0	**1.1**	NA	NA	3.1	NA	NA
SB-18	SB-18-0.5	12/7/2017	0.5	**1.3**	NA	NA	4.0	NA	NA
	SB-18-3	12/7/2017	3.0	**1.5**	NA	NA	3.7	NA	NA
SB-19	SB-19-0.5	12/8/2017	0.5	**17**	NA	NA	**90**	2.6	NA
	SB-19-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-20	SB-20-0.5	12/7/2017	0.5	**1.4**	NA	NA	7.7	NA	NA
	SB-20-3	12/7/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-21	SB-21-0.5	12/8/2017	0.5	**7.0**	NA	NA	28	NA	NA
	SB-21-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-22	SB-22-0.5	12/7/2017	0.5	**2.0**	NA	NA	8.3	NA	NA
	SB-22-3	12/7/2017	3.0	ND (<1.0)	NA	NA	3.7	NA	NA
SB-23	SB-23-0.5	12/8/2017	0.5	**2.5**	NA	NA	10	NA	NA
	SB-23-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-24	SB-24-0.5	12/8/2017	0.5	**19**	NA	NA	58	2.0	NA
	SB-24-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-25	SB-25-3	12/7/2017	3.0	**3.9**	NA	NA	2.7	NA	NA
SB-26	SB-26-0.5	12/7/2017	0.5	**1.3**	NA	NA	4.9	NA	NA
	SB-26-3	12/7/2017	3.0	ND (<1.0)	NA	NA	2.7	NA	NA
SB-27	SB-27-0.5	12/8/2017	0.5	**18**	NA	NA	**82**	3.0	NA
	SB-27-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-28	SB-28-0.5	12/8/2017	0.5	**7.4**	NA	NA	39	NA	NA
	SB-28-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-29	SB-29-0.5	12/8/2017	0.5	**20**	NA	NA	**95**	4.4	NA
	SB-29-3	12/8/2017	3.0	ND (<1.0)	NA	NA	3.2	NA	NA
SB-30	SB-30-0.5	12/8/2017	0.5	ND (<1.0)	NA	NA	5.7	NA	NA
	SB-30-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-31	SB-31-0.5	12/8/2017	0.5	**5.7**	NA	NA	22	NA	NA
	SB-31-3	12/8/2017	3.0	ND (<1.0)	NA	NA	2.8	NA	NA
SB-32	SB-32-3	12/8/2017	3.0	ND (<1.0)	NA	NA	2.6	NA	NA
SB-33	SB-33-0.5	12/8/2017	0.5	**14**	NA	NA	8.7	NA	NA
	SB-33-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-34	SB-34-0.5	12/8/2017	0.5	**19**	NA	NA	**84**	3.0	NA
	SB-34-3	12/8/2017	3.0	ND (<1.0)	NA	NA	ND (<2.5)	NA	NA
SB-35	SB-35-0.5	12/8/2017	0.5	**4.6**	NA	NA	20	NA	NA
	SB-35-3	12/8/2017	3.0	**3.8**	NA	NA	17	NA	NA
SB-36	SB-36-0.5	12/15/2017	0.5	**6.3**	NA	NA	68	NA	NA
SB-37	SB-37-0.5	12/15/2017	0.5	**8.8**	NA	NA	56	NA	NA
SB-38	SB-38-0.5	12/15/2017	0.5	**16**	NA	NA	**81**	NA	NA
SB-39	SB-39-0.5	12/15/2017	0.5	**19**	NA	NA	**110**	NA	NA
SB-40	SB-40-0.5	12/15/2017	0.5	**14**	NA	NA	**92**	NA	NA
SB-41	SB-41-0.5	12/15/2017	0.5	**8.7**	NA	NA	55	NA	NA
SB-42	SB-42-0.5	12/15/2017	0.5	**2.6**	NA	NA	6.7	NA	NA
SB-43	SB-43-0.5	12/15/2017	0.5	**15**	NA	NA	24	NA	NA

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TABLE 1
SOIL ANALYTICAL RESULTS – ARSENIC AND LEAD
Proposed Costco Wholesale Warehouse and Fuel Facility
Sierra College Boulevard and Brace Road
Loomis, California

Bore	Sample	Date Sampled	Sample Depth (feet bgs)	TTLC Arsenic (mg/kg) 6010B	STLC Arsenic (mg/L) STLC WET / 6010B	TCLP Arsenic (mg/L) TCLP	TTLC Lead (mg/kg) 6010B	STLC Lead (mg/L) STLC WET / 6010B	TCLP Lead (mg/L) TCLP
SB-44	SB-44-0.5	12/15/2017	0.5	**2.7**	NA	NA	9.3	NA	NA
SB-45	SB-45-0.5	12/15/2017	0.5	**2.7**	NA	NA	12	NA	NA
SB-46	SB-46-0.5	1/25/2018	0.5	**9.1**	NA	NA	23	NA	NA
SB-47	SB-47-0.5	1/25/2018	0.5	**8.3**	NA	NA	32	NA	NA
SB-48	SB-48-0.5	1/25/2018	0.5	**13**	NA	NA	50	1.7	NA
SB-49	SB-49-0.5	1/25/2018	0.5	**15**	NA	NA	**110**	1.5	ND (<0.50)
SB-50	SB-50-0.5	1/25/2018	0.5	**9.0**	NA	NA	53	1.7	NA
SB-51	SB-51-0.5	1/25/2018	0.5	**9.6**	NA	NA	56	0.93	NA
SB-52	SB-52-0.5	1/25/2018	0.5	**11**	NA	NA	40	NA	NA
SB-53	SB-53-0.5	1/25/2018	0.5	**7.1**	NA	NA	28	NA	NA
SB-54	SB-54-0.5	1/25/2018	0.5	**4.3**	NA	NA	25	NA	NA
SB-55	SB-55-0.5	1/25/2018	0.5	**1.4**	NA	NA	7.1	NA	NA
SB-56	SB-56-0.5	1/25/2018	0.5	**18**	NA	NA	**130**	3.0	ND (<0.50)
SB-57	SB-57-0.5	1/25/2018	0.5	**2.0**	NA	NA	12	NA	NA
SB-58	SB-58-0.5	1/25/2018	0.5	**15**	NA	NA	54	1.2	NA
SB-59	SB-59-0.5	1/25/2018	0.5	ND (<1.0)	NA	NA	2.7	NA	NA
SB-60	SB-60-0.5	1/25/2018	0.5	**15**	NA	NA	72	2.9	NA
Tier I ESL (mg/kg)				0.067	--	--	80	--	--
DTSC-SL – Residential (mg/kg)				0.11	--	--	80	--	--
DTSC-SL – Commercial/Industrial (mg/kg)				0.36	--	--	320	--	--
RSL – Residential (mg/kg)				0.68	--	--	400	--	--
RSL – Commercial/Industrial (mg/kg)				3.0	--	--	800	--	--
TTLC (mg/kg)				500	--	--	1,000	--	--
STLC (mg/L)				--	5.0	--	--	5.0	--
TCLP Value (mg/L)				--	--	5.0	--	--	5.0
			10 x STLC	50	--	--	50	--	--
			20 x TCLP	100	--	--	100	--	--

Notes:

TTLC	California Code of Regulations Title 22 Total Threshold Limit Concentration.
STLC	California Code of Regulations Title 22 Soluble Threshold Limit Concentration.
TCLP	Toxicity Characteristic Leaching Procedure.
mg/kg	Milligrams per kilogram.
mg/L	Milligrams per liter.
bgs	Below ground surface.
6010B	United States Environmental Protection Agency analytical method number.
WET	California Code of Regulations Title 22 Waste Extraction Test.
NA	Sample not analyzed for indicated analyte.
ND<2.47	Analyte not present at concentration at or above indicated laboratory reporting limit.
Tier I ESL	San Francisco Bay Regional Water Quality Control Board Tier 1 Environmental Screening Level for soil (February 2016).
DTSC-SL	Recommended soil screening level provided in California Environmental Protection Agency, Department of Toxic Substances Control, Office of Human and Ecological Risk (HERO) Human Health Risk Assessment Note No. 3 (January 2018).
RSL	US EPA Regional Screening Level for soil (November 2017).
60.8	Result shown in bold font is higher than Tier I ESL.
65	Result shown in yellow-highlighted background is higher than 10 times the analyte's STLC.
110	Result shown in orange-highlighted background is higher than 20 times the analyte's TCLP.
NL	Analyte or value is not listed.

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TABLE 2
GROUNDWATER ANALYTICAL RESULTS – TPH-d
Proposed Costco Wholesale Warehouse and Fuel Facility
Sierra College Boulevard and Brace Road
Loomis, California

Bore	Sample	Date Sampled	TPH-d (C_{12}-C_{22}) (mg/L) 8015B
GW-1	GW-1	1/25/2018	ND (<0.050)
GW-2	GW-2	1/25/2018	ND (<0.050)
GW-3	GW-3	1/25/2018	ND (<0.050)
Tier I ESL (mg/L)			0.100

Notes:

TPH-d	Diesel-range total petroleum hydrocarbons.
C_{12}-C_{22}	Hydrocarbon carbon range.
mg/L	Milligrams per liter.
8015M / 8260B	United States Environmental Protection Agency analytical method number.
ND<100	Analyte not present at concentration at or above indicated laboratory reporting limit.
Tier I ESL	San Francisco Bay Regional Water Quality Control Board Tier 1 Environmental Screening Level for groundwater (February 2016).

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BORE LOGS

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SAMPLER AND DRILLING METHOD GRAPHICS

- BULK / GRAB / BAG SAMPLE
- MODIFIED CALIFORNIA SAMPLER (2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)
- CALIFORNIA SAMPLER (3 in. (76.2 mm.) outer diameter)
- STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
- HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)
- SHELBY TUBE SAMPLER
- HOLLOW STEM AUGER
- SOLID STEM AUGER
- WASH BORING
- SONIC CONTINUOUS SAMPLER

GROUND WATER GRAPHICS

- WATER LEVEL (level where first observed)
- WATER LEVEL (level after exploration completion)
- WATER LEVEL (additional levels after exploration)
- OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS
WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	**GRAVELS** (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu ≥4 and 1≤ Cc≤3	**GW**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			Cu <4 and/ or 1>Cc >3	**GP**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH 5% TO 12% FINES	Cu ≥4 and 1≤ Cc≤3	**GW-GM**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
			Cu <4 and/ or 1>Cc >3	**GP-GM**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH > 12% FINES		**GM**	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu ≥6 and 1≤ Cc≤3	**SW**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			Cu <6 and/ or 1>Cc >3	**SP**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH 5% TO 12% FINES	Cu ≥6 and 1≤ Cc≤3	**SW-SM**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
			Cu <6 and/ or 1>Cc >3	**SP-SM**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		SANDS WITH > 12% FINES		**SM**	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES

FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)	**ML**	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid Limit greater than 50)	**MH**	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

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PROJECT NO.: 20172062
DRAWN BY:
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DATE:
REVISED: -

GRAPHICS KEY

Costco Loomis Supplemental ESA
SEC Brace Rd and Sierra College Blvd
Loomis, CA

B-1

PLOTTED: 03/14/2018 03:26 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [LEGEND 1 (GRAPHICS KEY) USCS_SOU_CAL]

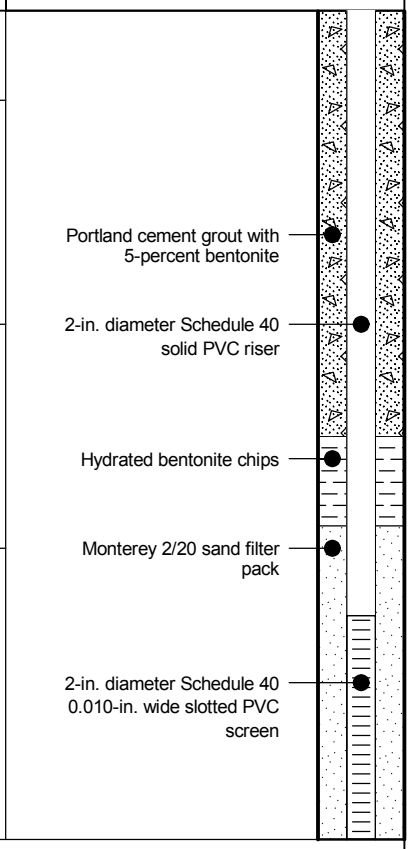
Date Begin - End:	1/24/2018	**Drilling Company:**	Taber Drilling
Logged By:	B. Connelly	**Drill Crew:**	Rick, Jason
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Limited Access Track Rig
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	Overcast	**Bore Diameter:**	6 in. O.D.

MONITORING WELL GW-1 LOG

FIELD EXPLORATION | MONITORING WELL CONSTRUCTION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hollow-Stem Auger				0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
					0.0		**Well-Graded SAND (SW)**: yellowish brown, dry
5							
							Well-Graded SAND with Gravel (SW): yellowish brown, moist
10							
					0.0		**Well-Graded SAND with Clay (SW-SC)**: brownish gray, wet
15							
20							
25							



The bore was terminated at approximately 18.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
- Groundwater was observed at approximately 14 ft. below ground surface during drilling.
- Groundwater was observed at approximately 9 ft. below ground surface at the end of drilling.
- Groundwater was observed at 8.78 ft. below top of casing before purging and sampling.

GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.

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MONITORING WELL GW-1 LOG

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Loomis, CA

APPENDIX

B-2

PLOTTED: 03/19/2018 09:54 AM BY: SBoyer
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

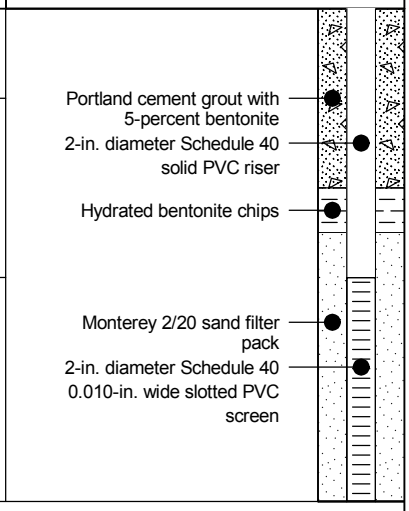
Date Begin - End:	1/24/2018	**Drilling Company:**	Taber Drilling
Logged By:	B. Connelly	**Drill Crew:**	Rick, Jason
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Limited Access Track Rig
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	Overcast	**Bore Diameter:**	6 in. O.D.

MONITORING WELL GW-2 LOG

FIELD EXPLORATION | MONITORING WELL CONSTRUCTION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hollow-Stem Auger				0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): yellowish brown, wet
							Well-Graded SAND with Clay (SW-SC): brown to grey, wet



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The bore was terminated at approximately 11 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
- Groundwater was observed at approximately 6 ft. below ground surface during drilling.
- Groundwater was observed at approximately 3 ft. below ground surface at the end of drilling.
- Groundwater was observed at 3.25 ft. below top of casing before purging and sampling.

GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.

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PROJECT NO.:	20172062
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DATE:	
REVISED:	-

MONITORING WELL GW-2 LOG

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APPENDIX

B-3

PLOTTED: 03/19/2018 09:54 AM BY: SBoyer
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

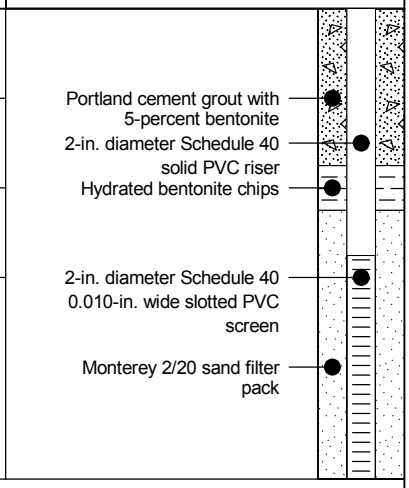
Date Begin - End:	1/24/2018	**Drilling Company:**	Taber Drilling
Logged By:	B. Connelly	**Drill Crew:**	Rick, Jason
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Limited Access Track Rig
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	Overcast	**Bore Diameter:**	6 in. O.D.

MONITORING WELL GW-3 LOG

FIELD EXPLORATION | MONITORING WELL CONSTRUCTION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hollow-Stem Auger				0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
					0.0		**Well-Graded SAND (SW)**: yellowish brown, moist
5							**Well-Graded SAND with Clay (SW)**: yellowish brown, wet
					0.0		**Well-Graded SAND with Clay (SW)**: yellowish brown, wet
10					0.0		
15							
20							
25							



The bore was terminated at approximately 10.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
- Groundwater was observed at approximately 6 ft. below ground surface during drilling.
- Groundwater was observed at approximately 4 ft. below ground surface at the end of drilling.
- Groundwater was observed at 3.63 ft. below top of casing before purging and sampling.

GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.

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MONITORING WELL GW-3 LOG

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APPENDIX

B-4

PLOTTED: 03/19/2018 09:54 AM BY: SBoyer
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-01 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-01-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-01-3		0.0		**Well-graded SAND**: reddish yellow, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-01 LOG		APPENDIX
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PLOTTED: 03/12/2018 12:12 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-02 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-02-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-02-3		0.0		

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-02 LOG		APPENDIX
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-03 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-03-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-03-3		0.0		**Well-graded SAND (SW)**: red, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-03 LOG		APPENDIX
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PLOTTED: 03/12/2018 12:12 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling
Logged By:	B. Connelly	**Drill Crew:**	
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.

BORE SB-04 LOG

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-04-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-04-3		0.0		**Well-graded SAND (SC)**: yellowish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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BORE SB-04 LOG

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APPENDIX
B-8

PLOTTED: 03/12/2018 12:12 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-05 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-05-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-05-3		0.0		**Well-graded SAND (SC)**: brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-05 LOG		APPENDIX
DRAWN BY: SEB			B-9
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
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PLOTTED: 03/14/2018 02:16 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-06 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-06-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-06-3		0.0		**Well-graded SAND (SW)**: brown

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-06 LOG		APPENDIX
DRAWN BY: SEB			
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DATE:			
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PLOTTED: 03/12/2018 12:13 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-07 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-07-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
				NR	0.0		**Well-graded SAND**: yellowish brown, dry
		☒	SB-07-3		0.0		
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.:	20172062
DRAWN BY:	SEB
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DATE:	
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BORE SB-07 LOG

Costco Loomis Supplemental ESA
SEC Brace Rd and Sierra College Blvd
Loomis, CA

APPENDIX

B-11

PLOTTED: 03/12/2018 12:13 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-08 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-08-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-08-3		0.0		**Well-graded SAND (SW)**: reddish yellow, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-08 LOG		APPENDIX
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-09 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-09-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-09-3		0.0		**SAND (SP)**: fine-grained, yellowish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-09 LOG		APPENDIX
DRAWN BY: SEB			B-13
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-10 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Direct Push	☒	SB-10-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-graded SAND (SW): reddish yellow
		☒	SB-10-3		0.0		

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.:	20172062
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BORE SB-10 LOG

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APPENDIX

B-14

PLOTTED: 03/12/2018 12:13 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-11 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-11-0.5		0.0		**Well-graded SAND with Gravel (SW)**: light brownish gray, dry
		☒	SB-11-3		0.0		**Well-graded SAND (SW)**: reddish yellow, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.:	20172062
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BORE SB-11 LOG

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APPENDIX

B-15

PLOTTED: 03/14/2018 02:16 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-12 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Direct Push		SB-12-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-12-3		0.0		**Well-graded SAND (SW)**: light brownish gray, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.:	20172062
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BORE SB-12 LOG

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APPENDIX

B-16

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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-13 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-13-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-13-3		0.0		**Well-graded SAND (SW)**: yellow, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-13 LOG		APPENDIX
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-14 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-14-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-14-3		0.0		**Well-graded SAND (SW)**: yellow, dry yellowish brown

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-14 LOG		APPENDIX
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PROJECT NUMBER: 20172062
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gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-15 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-15-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-15-3		0.0		**Well-graded SAND with Gravel (SW)**: yellowish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-15 LOG		APPENDIX
DRAWN BY: SEB			B-19
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PROJECT NUMBER: 20172062
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Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-16 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-16-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
					0.0		**Fine SAND (SW)**: olive yellow, dry
			SB-16-3		0.0		

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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BORE SB-16 LOG

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APPENDIX

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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-17 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-17-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
					0.0		**Well-graded SAND (SW)**: yellowish brown, dry
			SB-17-3		0.0		

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-17 LOG		APPENDIX
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PROJECT NUMBER: 20172062
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Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-18 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-18-0.5		0.0		**Well-graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-18-3		0.0		**Well-graded SAND (SW)**: reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

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GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-18 LOG		APPENDIX
DRAWN BY: SEB			B-22
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-19 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-19-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-19-3		0.0		**Well-Graded SAND (SW)**: brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-19 LOG		APPENDIX
DRAWN BY: SEB			B-23
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PROJECT NUMBER: 20172062
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Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-20 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-20-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-20-3		0.0		**Well-Graded SAND (SW)**: light brownish gray, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-20 LOG		APPENDIX
DRAWN BY: SEB			B-24
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
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PLOTTED: 03/12/2018 12:14 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2007	**Drilling Company:**	Cascade Drilling	**BORE SB-21 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-21-0.5		0.0		**Well GRADED SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-21-3		0.0		**Poorly Graded SAND (SP)**: reddish brown, dry
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The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2007.

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PROJECT NO.: 20172062	BORE SB-21 LOG		APPENDIX
DRAWN BY: SEB			B-25
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-22 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-22-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-22-3		0.0		**Well-Graded SAND (SW)**: red, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-22 LOG		APPENDIX
DRAWN BY: SEB			
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		B-26
DATE:			
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PLOTTED: 03/12/2018 12:14 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-23 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-23-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-23-3		0.0		**Well-Graded SAND with Clay (SW-SC)**: olive gray, moist

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-23 LOG		APPENDIX
DRAWN BY: SEB			B-27
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DATE:			
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PLOTTED: 03/12/2018 12:14 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-24 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-24-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-24-3		0.0		**Well-Graded SAND (SW)**: reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-24 LOG		APPENDIX
DRAWN BY: SEB			B-28
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-25 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger						**Well-Graded SAND with Clay (SW-SC)**
		☒	SB-25-3		0.0		**Well-Graded SAND (SW)**
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-25 LOG		APPENDIX
DRAWN BY: SEB			B-29
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/07/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-26 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-26-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
			SB-26-3		0.0		**Poorly Graded SAND (SP)**: reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 07, 2017.

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PROJECT NO.: 20172062	BORE SB-26 LOG		APPENDIX
DRAWN BY: SEB			
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-27 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-27-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-27-3		0.0		**Well-Graded SAND (SW)**: red, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.:	20172062
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BORE SB-27 LOG

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APPENDIX

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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-28 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-28-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-28-3		0.0		**Well-Graded SAND (SW)**: reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-28 LOG		APPENDIX
DRAWN BY: SEB			B-32
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-29 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-29-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
					0.0		**Well-Graded SAND (SW)**: red, dry
		☒	SB-29-3		0.0		
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The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.:	20172062
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BORE SB-29 LOG

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APPENDIX

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PROJECT NUMBER: 20172062
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Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-30 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-30-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-30-3		0.0		**Well-Graded SAND (SW)**: red, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-30 LOG		APPENDIX
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-31 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-31-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-31-3		0.0		**Well-Graded SAND (SW)**: red, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-31 LOG		APPENDIX
DRAWN BY: SEB			
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DATE:			
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE LOG SB-32**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-32-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-32-3		0.0		**Well-Graded SAND (SW)**: reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with portland cement grout mixed with 5-percent bentonite. on December 08, 2017.

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PROJECT NO.: 20172062	BORE LOG SB-32		APPENDIX
DRAWN BY: SEB			
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-33 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-33-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-33-3		0.0		**Well-Graded SAND (SW)**: red, dry

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The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.:	20172062
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BORE SB-33 LOG

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APPENDIX

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PLOTTED: 03/12/2018 12:15 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-34 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-34-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
		☒	SB-34-3		0.0		**Poorly Graded SAND (SP)**: reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.: 20172062	BORE SB-34 LOG		APPENDIX
DRAWN BY: SEB			B-38
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/08/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-35 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger		SB-35-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
					0.0		**Poorly Graded SAND (SP)**: reddish brown, dry
			SB-35-3		0.0		
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 08, 2017.

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PROJECT NO.:	20172062
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BORE SB-35 LOG

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APPENDIX

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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-36 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-36-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): yellowish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.: 20172062	BORE SB-36 LOG		APPENDIX
DRAWN BY: SEB			B-40
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-37 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Surface Condition: Grass Lithologic Description
	Hand Auger	☒	SB-37-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown
							Well-Graded SAND (SW): yellowish brown
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.: 20172062	BORE SB-37 LOG		APPENDIX
DRAWN BY: SEB			B-41
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
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OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-38 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-38-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.:	20172062
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BORE SB-38 LOG

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APPENDIX

B-42

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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-39 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-39-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.:	20172062
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BORE SB-39 LOG

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APPENDIX

B-43

PLOTTED: 03/12/2018 12:16 PM BY: LDandridge
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-40 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-40-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.: 20172062	BORE SB-40 LOG		APPENDIX
DRAWN BY: SEB			B-44
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-41 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-41-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): yellowish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.: 20172062	BORE SB-41 LOG		APPENDIX
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling
Logged By:	B. Connelly	**Drill Crew:**	
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.

BORE SB-42 LOG

FIELD EXPLORATION

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Surface Condition: Grass Lithologic Description
	Hand Auger	☒	SB-42-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry

5

10

15

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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BORE SB-42 LOG

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APPENDIX

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PLOTTED: 03/14/2018 01:44 PM BY: LDandridge
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-43 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-43-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.:	20172062
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BORE SB-43 LOG

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APPENDIX

B-47

PLOTTED: 03/12/2018 12:16 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
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Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-44 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Surface Condition: Grass Lithologic Description
	Hand Auger	☒	SB-44-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded (SW): reddish brown, dry

The bore was terminated at approximately 3.5 ft. below ground surface.

5

10

15

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.: 20172062	BORE SB-44 LOG		APPENDIX
DRAWN BY: SEB			B-48
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PROJECT NUMBER: 20172062
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Date Begin - End:	12/15/2017	**Drilling Company:**	Cascade Drilling	**BORE SB-45 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Sunny, Clear	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-45-0.5		0.0		**SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on December 15, 2017.

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PROJECT NO.: 20172062	BORE SB-45 LOG		APPENDIX
DRAWN BY: SEB			B-49
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-46 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-46-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): red, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-46 LOG		APPENDIX
DRAWN BY: SEB			B-50
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-47 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-47-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): yellowish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.:	20172062
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BORE SB-47 LOG

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APPENDIX

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PLOTTED: 03/14/2018 01:53 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-48 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-48-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): red, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-48 LOG		APPENDIX
DRAWN BY: SEB			B-52
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-49 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-49-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-49 LOG		APPENDIX
DRAWN BY: SEB			B-53
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-50 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-50-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-50 LOG		APPENDIX
DRAWN BY: SEB			B-54
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:17 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-51 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-51-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-51 LOG		APPENDIX
DRAWN BY: SEB			B-55
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:17 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-52 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-52-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish yellow, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-52 LOG		APPENDIX
DRAWN BY: SEB			B-56
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:17 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-53 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-53-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): light brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.:	20172062
DRAWN BY:	SEB
CHECKED BY:	
DATE:	
REVISED:	-

BORE SB-53 LOG

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SEC Brace Rd and Sierra College Blvd
Loomis, CA

APPENDIX

B-57

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-54 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-54-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-54 LOG		APPENDIX
DRAWN BY: SEB			B-58
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-55 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-55-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.:	20172062
DRAWN BY:	SEB
CHECKED BY:	
DATE:	
REVISED:	-

BORE SB-55 LOG

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SEC Brace Rd and Sierra College Blvd
Loomis, CA

APPENDIX

B-59

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-56 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-56-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish yellow, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-56 LOG		APPENDIX
DRAWN BY: SEB			B-60
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-57 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-57-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.:	20172062
DRAWN BY:	SEB
CHECKED BY:	
DATE:	
REVISED:	-

BORE SB-57 LOG

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SEC Brace Rd and Sierra College Blvd
Loomis, CA

APPENDIX

B-61

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-58 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-58-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): red, dry

5

10

15

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-58 LOG		APPENDIX
DRAWN BY: SEB			B-62
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-59 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-59-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.:	20172062
DRAWN BY:	SEB
CHECKED BY:	
DATE:	
REVISED:	-

BORE SB-59 LOG

Costco Loomis Supplemental ESA
SEC Brace Rd and Sierra College Blvd
Loomis, CA

APPENDIX

B-63

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
OFFICE FILTER: IRVINE
PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

Date Begin - End:	1/25/2018	**Drilling Company:**	Taber Drilling	**BORE SB-60 LOG**
Logged By:	B. Connelly	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**		
Plunge:	-90 degrees	**Drilling Method:**	See Drilling Method Column	
Weather:	Light Rain	**Borehole Diameter:**	3 in. O.D.	

FIELD EXPLORATION

Surface Condition: Grass

Depth (feet)	Drilling Method	Sample Type	Sample Number	Recovery (NR=No Recovery)	PID (ppmv)	Graphical Log	Lithologic Description
	Hand Auger	☒	SB-60-0.5		0.0		**Well-Graded SAND with Clay (SW-SC)**: dark brown, moist
							Well-Graded SAND (SW): reddish brown, dry
5							
10							
15							

The bore was terminated at approximately 3.5 ft. below ground surface.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:
ft. = feet.
in. = inches.
O.D. = outer diameter.
ppmv = parts per million by volume.
A photoionization detector (PID) was used for environmental field screening.
The bore was backfilled with Portland cement grout mixed with 5-percent bentonite on January 25, 2018.

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PROJECT NO.: 20172062	BORE SB-60 LOG		APPENDIX
DRAWN BY: SEB			B-64
CHECKED BY:	Costco Loomis Supplemental ESA SEC Brace Rd and Sierra College Blvd Loomis, CA		
DATE:			
REVISED: -			PAGE: 1 of 1

PLOTTED: 03/12/2018 12:18 PM BY: LDandridge
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PROJECT NUMBER: 20172062
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_ENVIRONMENTAL LOG]

GROUNDWATER SAMPLING DATA SHEETS

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Groundwater Sampling Datasheet, Grab Sample

Location ID:	GW-1	Sample ID:	GW-1
Project Name:	Cotsco Loomis	Date Gauged:	1/25/2018
Project Number:	20172062	Date Purged:	1/25/2018
Project Location:	Sierra College Parkway and Branch Road Loomis, CA	Date Sampled:	1/25/2018
		Time Sampled:	12:30
Depth to Water, bgs:	8.78 ft	Casing Diameter:	2"
Total Well Depth, bgs:	18.5 ft	Well Condition:	Good
Purge Volume:	20 L	Vapor Reading:	0.0 ppm
Purge Method:	Bailer	Presence of NAPL:	None obs.
Sample Method:	Peristaltic		

Water Quality Parameters

Oxidation Reduction Potential, mV	Specific Conductivity, mS/cm	Temperature, °C	Dissolved Oxygen, mg/L	pH	Turbidity, NTU	Odor
+112	0.542	16.25	4.62	7.44	313	none

Sample Containers: 2 x 500 mL amber jar

Analysis Requested: TPH-DRO by USEPA 8015B

Notes: Well was given a quick development in the morning (~9:30 AM) by driller, about 20 Liters was bailed from the well.

Groundwater Sampling Datasheet, Grab Sample

Location ID:	GW-2	Sample ID:	GW-2
Project Name:	Cotsco Loomis	Date Gauged:	1/25/2018
Project Number:	20172062	Date Purged:	1/25/2018
Project Location:	Sierra College Parkway and Branch Road Loomis, CA	Date Sampled:	1/25/2018
		Time Sampled:	12:15
Depth to Water, bgs:	3.25 ft	Casing Diameter:	2"
Total Well Depth, bgs:	11.2 ft	Well Condition:	OK
Purge Volume:	12 L	Vapor Reading:	0.0 ppm
Purge Method:	Bailer	Presence of NAPL:	None obs.
Sample Method:	Peristaltic		

Water Quality Parameters

Oxidation Reduction Potential, mV	Specific Conductivity, mS/cm	Temperature, °C	Dissolved Oxygen, mg/L	pH	Turbidity, NTU	Odor
-250	0.912	16.05	3.84	7.72	563	none

Sample Containers: 2 x 9 oz jar

Analysis Requested: TPH-DRO by USEPA 8015B

Notes: Well was given a quick development in the morning (~9:00 AM) by driller, about 12 Liters was bailed from the well. The recharge was a bit slower at this location compared to the other wells.

Groundwater Sampling Datasheet, Grab Sample

Location ID:	GW-3	Sample ID:	GW-3
Project Name:	Cotsco Loomis	Date Gauged:	1/25/2018
Project Number:	20172062	Date Purged:	1/25/2018
Project Location:	Sierra College Parkway and Branch Road Loomis, CA	Date Sampled:	1/25/2018
		Time Sampled:	0:00
Depth to Water, bgs:	3.63 ft	Casing Diameter:	2"
Total Well Depth, bgs:	10.5 ft	Well Condition:	OK
Purge Volume:	20 L	Vapor Reading:	0.0 ppm
Purge Method:	Bailer	Presence of NAPL:	None obs.
Sample Method:	Peristaltic		

Water Quality Parameters

Oxidation Reduction Potential, mV	Specific Conductivity, mS/cm	Temperature, °C	Dissolved Oxygen, mg/L	pH	Turbidity, NTU	Odor
+84	0.792	15.93	6.18	8.22	800	none

Sample Containers: 2 x 500mL amber bottle

Analysis Requested: TPH-DRO by USEPA 8015B

Notes: Well was given a quick development in the morning (~8:30 AM) by driller, about 20 Liters was bailed from the well.

LABORATORY ANALYTICAL REPORTS

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CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

December 14, 2017

CLS Work Order #: 17L0349
COC #: 184190, 184191, 184193, 184194

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Ste 250
irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 12/07/17 16:48. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.; [illegible]

LOG № 184190

REPORT TO:

NAME AND ADDRESS: Paolo Dicon, Kleinfelder, 2 Ada, Irvine, CA

PROJECT MANAGER: Paolo Dicon PHONE #

PROJECT NAME: Costco Loomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION: Ph II

SITE LOCATION

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY:

☒ CLS (916) 638-7301, 3249 FITZGERALD RD, RANCHO CORDOVA, CA. 95742

☐ OTHER

GEOTRACKER:

EDF REPORT ☐ YES ☐ NO

GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	PRESERVATIVES	ANALYSIS REQUESTED: Lead and Arsenic 6010B	1 DAY	2 DAY	3 DAY	5 DAY
12-07-17	0830	SB-02-0.5	Soil	1	Jar		X				X
	0835	SB-02-3					X				
	0845	SB-10-0.5			Sleeve		X				
	0850	SB-10-3					X				
	0855	SB-12-0.5					X				
	0900	SB-12-3					X				
	0910	SB-08-0.5			Jar		X				
	0915	SB-08-3					X				
	0920	SB-05-0.5					X				
	0925	SB-05-3					X				
	0930	SB-06-0.5					X				
	0940	SB-06-3					X				
	0945	SB-07-0.5					X				

INVOICE TO: H = hold

P.O. #

QUOTE #

SUSPECTED CONSTITUENTS

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
[signature]	Brandon Connelly, KLF	12-07-17/1600	[signature]	CONRAD SR/CL
[signature]	CL	12/7/17/1648H		

REC'D AT LAB BY: [signature] DATE / TIME: 12-7-17 1648 CL

CONDITIONS / COMMENTS:

SHIPPED BY: ☒ FED X ☐ UPS ☒ OTHER

AIR BILL #

White-Lab/Terms and conditions Yellow- Lab file copy/Terms and Conditions Pink- Origin/Terms and Conditions Gold-Project Mgr./Field Sampler/Terms and conditions

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.: 1762349

LOG № 184194

REPORT TO:

NAME AND ADDRESS: Kleinfelder, 2 Ada Smile 250, Irvine, CA 92618

PROJECT MANAGER: Paolo Dicon PHONE#

PROJECT NAME: Costco Loomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION:

SITE LOCATION:

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY:

☒ CLS (916) 638-7301, 3249 FITZGERALD RD., RANCHO CORDOVA, CA 95742

☐ OTHER

GEOTRACKER:

EDF REPORT ☐ YES ☐ NO

GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

ANALYSIS REQUESTED

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Lead and Arsenic 6010B	5 DAY
12-07-17	0950	SB-07-3	Soil	1	Jar		X	X
	1000	SB-04-0.5					X	
	1005	SB-04-3					X	
	1010	SB-03-0.5					X	
	1015	SB-03-3					X	
	1020	SB-01-0.5					X	
	1025	SB-01-3					X	
	1035	SB-09-0.5					X	
	1040	SB-09-3					X	
	1100	SB-11-0.5					X	
	1105	SB-11-3					X	
	1215	SB-13-3					X	
	1220	SB-14-0.5					X	

INVOICE TO:

P.O. #:

QUOTE #:

SUSPECTED CONSTITUENTS:

PRESERVATIVES: (1) HCl (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
	Brandon Connelly / KLF CLS	12-07-17 / 1600		Oscar Rodriguez
		12/7/17 / 1648H		

RECD AT LAB BY: DATE / TIME: 12-7-17 / 1848

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☒ OTHER CLS

AIR BILL #

White-Lab/Terms and conditions Yellow-Lab file copy/Terms and Conditions Pink-Origin/Terms and Conditions Gold-Project Mgr./Field Sampler/Terms and conditions

3 of 4

CLS - Labs

CHAIN OF CUSTODY CLS ID No.; 17L0349 LOG № 184193

REPORT TO:

NAME AND ADDRESS: Kleinfelder
2 AdA St. 250
Irvine, CA 92618

PROJECT MANAGER: Paolo Bizon PHONE#

PROJECT NAME: Costco Loomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION:

SITE LOCATION:

CLIENT JOB NUMBER: 2017 2062

DESTINATION LABORATORY:
☒ CLS (916) 638-7301
3249 FITZGERALD RD
RANCHO CORDOVA, CA
95742

☐ OTHER

PRESERVATIVES

ANALYSIS REQUESTED: lead and Arsenic 6000

GEOTRACKER:
EDF REPORT ☐ YES ☐ NO
GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY, 2 DAY, 3 DAY, 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO.	CONTAINER TYPE	lead and Arsenic 6000	1 DAY	2 DAY	3 DAY	5 DAY	SPECIAL INSTRUCTIONS
12-07-17	1225	SB-14-3	Soil	1	JAC	X				X	
	1230	SB-15-0.5				X					
	1235	SB-15-3				X					
	1240	SB-16-0.5				X					
	1245	SB-16-3				X					
	1250	SB-17-0.5				X					
	1255	SB-17-3				X					
	1300	SB-18-0.5				X					
	1305	SB-18-3				X					INVOICE TO:
	1315	SB-22-0.5				X					
	1320	SB-22-3				X					
	1330	SB-20-0.5				X					PO. #
	1335	SB-20-3				X					QUOTE #

SUSPECTED CONSTITUENTS:

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
[signature]	Brandon Connelly / KLF	12-07-17 1600	[signature]	CONRAD JR / CU
[signature]	CEI	12/7/17 1648H		

REC'D AT LAB BY: [signature] DATE / TIME: 12-17-17 1648 CEI

CONDITIONS / COMMENTS:

SHIPPED BY: ☒ FED X ☐ UPS ☒ OTHER

AIR BILL #

White-Lab/Terms and conditions Yellow-Lab file copy/Terms and Conditions Pink-Origin/Terms and Conditions Gold-Project Mgr./Field Sampler/Terms and conditions

4 of 4

CLS - Labs

CHAIN OF CUSTODY CLS ID No.; 17K0349 LOG № 184191

REPORT TO:

NAME AND ADDRESS: Kleinfelder
2 Ada St 250
Irvine, CA 92618

PROJECT MANAGER: Paolo Diech PHONE #:

PROJECT NAME: Costco Loomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION:

SITE LOCATION:

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY:
☒ CLS (916) 638-7301
3249 FITZGERALD RD.
RANCHO CORDOVA, CA.
95742

☐ OTHER

PRESERVATIVES

ANALYSIS REQUESTED: lead and Arsenic 6010B

GEOTRACKER:
EDF REPORT ☐ YES ☐ NO
GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY, 2 DAY, 3 DAY, 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	lead and Arsenic 6010B	1 DAY	2 DAY	3 DAY	5 DAY
12.07.17	1345	SB-25-3	Soil	1	JAR	X				X
↓	1355	SB-26-0.5	↓	↓	↓	X				↓
↓	1400	SB-26-3	↓	↓	↓	X				↓

INVOICE TO:

P.O. #

QUOTE #

SUSPECTED CONSTITUENTS:

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
[signature]	Brandon Connelly / KLF CLS	12-07-17 / 1600 12/7/17 1650H	[signature]	CONRAD JR / CLI

REC'D AT LAB BY: [signature] DATE / TIME: 12 7 17 1645

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☒ OTHER CLI AIR BILL #

White-Lab/Terms and conditions Yellow-Lab file copy/Terms and Conditions Pink-Origin/Terms and Conditions Gold-Project Mgr./Field Sampler/Terms and conditions

CALIFORNIA LABORATORY SERVICES

 12/14/17 13:13

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-02-0.5 (17L0349-01) Soil Sampled: 12/07/17 08:30 Received: 12/07/17 16:48									
Arsenic	**2.7**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**16**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-02-3 (17L0349-02) Soil Sampled: 12/07/17 08:35 Received: 12/07/17 16:48									
Arsenic	**3.6**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**23**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-10-0.5 (17L0349-03) Soil Sampled: 12/07/17 08:45 Received: 12/07/17 16:48									
Arsenic	**1.3**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**2.9**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-10-3 (17L0349-04) Soil Sampled: 12/07/17 08:50 Received: 12/07/17 16:48									
Arsenic	**1.5**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**4.4**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-12-0.5 (17L0349-05) Soil Sampled: 12/07/17 08:55 Received: 12/07/17 16:48									
Arsenic	**14**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**76**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-12-3 (17L0349-06) Soil Sampled: 12/07/17 09:00 Received: 12/07/17 16:48									
Arsenic	**1.2**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-08-0.5 (17L0349-07) Soil Sampled: 12/07/17 09:10 Received: 12/07/17 16:48									
Arsenic	**24**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**87**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/14/17 13:13

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-08-3 (17L0349-08) Soil Sampled: 12/07/17 09:15 Received: 12/07/17 16:48									
Arsenic	**1.2**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**2.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-05-3 (17L0349-10) Soil Sampled: 12/07/17 09:25 Received: 12/07/17 16:48									
Arsenic	**1.5**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**2.9**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-06-0.5 (17L0349-11) Soil Sampled: 12/07/17 09:30 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**4.0**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-06-3 (17L0349-12) Soil Sampled: 12/07/17 09:40 Received: 12/07/17 16:48									
Arsenic	**1.3**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**5.3**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-07-0.5 (17L0349-13) Soil Sampled: 12/07/17 09:45 Received: 12/07/17 16:48									
Arsenic	**17**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**73**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-07-3 (17L0349-14) Soil Sampled: 12/07/17 09:50 Received: 12/07/17 16:48									
Arsenic	**1.5**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**3.4**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-04-0.5 (17L0349-15) Soil Sampled: 12/07/17 10:00 Received: 12/07/17 16:48									
Arsenic	**1.3**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**4.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/14/17 13:13

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-04-3 (17L0349-16) Soil Sampled: 12/07/17 10:05 Received: 12/07/17 16:48									
Arsenic	**1.1**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-03-0.5 (17L0349-17) Soil Sampled: 12/07/17 10:10 Received: 12/07/17 16:48									
Arsenic	**1.3**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**8.6**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-03-3 (17L0349-18) Soil Sampled: 12/07/17 10:15 Received: 12/07/17 16:48									
Arsenic	**1.2**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**3.3**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-01-0.5 (17L0349-19) Soil Sampled: 12/07/17 10:20 Received: 12/07/17 16:48									
Arsenic	**1.1**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**4.6**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-01-3 (17L0349-20) Soil Sampled: 12/07/17 10:25 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**2.9**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-09-0.5 (17L0349-21) Soil Sampled: 12/07/17 10:35 Received: 12/07/17 16:48									
Arsenic	**31**	1.0	mg/kg	10	1709442	12/09/17	12/11/17	EPA 6020	
Lead	**160**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-09-3 (17L0349-22) Soil Sampled: 12/07/17 10:40 Received: 12/07/17 16:48									
Arsenic	**6.3**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**5.3**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/14/17 13:13

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-11-0.5 (17L0349-23) Soil Sampled: 12/07/17 11:00 Received: 12/07/17 16:48									
Arsenic	**2.1**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**5.1**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-11-3 (17L0349-24) Soil Sampled: 12/07/17 11:05 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-13-3 (17L0349-25) Soil Sampled: 12/07/17 12:15 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-14-0.5 (17L0349-26) Soil Sampled: 12/07/17 12:20 Received: 12/07/17 16:48									
Arsenic	**1.0**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**3.5**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-14-3 (17L0349-27) Soil Sampled: 12/07/17 12:25 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-15-0.5 (17L0349-28) Soil Sampled: 12/07/17 12:30 Received: 12/07/17 16:48									
Arsenic	**1.8**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**17**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-15-3 (17L0349-29) Soil Sampled: 12/07/17 12:35 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/14/17 13:13

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-16-0.5 (17L0349-30) Soil Sampled: 12/07/17 12:40 Received: 12/07/17 16:48									
Arsenic	**8.5**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**37**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-16-3 (17L0349-31) Soil Sampled: 12/07/17 12:45 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-17-0.5 (17L0349-32) Soil Sampled: 12/07/17 12:50 Received: 12/07/17 16:48									
Arsenic	**1.1**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**4.2**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-17-3 (17L0349-33) Soil Sampled: 12/07/17 12:55 Received: 12/07/17 16:48									
Arsenic	**1.1**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**3.1**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-18-0.5 (17L0349-34) Soil Sampled: 12/07/17 13:00 Received: 12/07/17 16:48									
Arsenic	**1.3**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**4.0**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-18-3 (17L0349-35) Soil Sampled: 12/07/17 13:05 Received: 12/07/17 16:48									
Arsenic	**1.5**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**3.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-22-0.5 (17L0349-36) Soil Sampled: 12/07/17 13:15 Received: 12/07/17 16:48									
Arsenic	**2.0**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**8.3**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

12/14/17 13:13

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-22-3 (17L0349-37) Soil Sampled: 12/07/17 13:20 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**3.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-20-0.5 (17L0349-38) Soil Sampled: 12/07/17 13:30 Received: 12/07/17 16:48									
Arsenic	**1.4**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**7.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-20-3 (17L0349-39) Soil Sampled: 12/07/17 13:35 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-25-3 (17L0349-40) Soil Sampled: 12/07/17 13:45 Received: 12/07/17 16:48									
Arsenic	**3.9**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**2.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-26-0.5 (17L0349-41) Soil Sampled: 12/07/17 13:55 Received: 12/07/17 16:48									
Arsenic	**1.3**	1.0	mg/kg	10	1709443	12/09/17	12/11/17	EPA 6020	
Lead	**4.9**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-26-3 (17L0349-42) Soil Sampled: 12/07/17 14:00 Received: 12/07/17 16:48									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**2.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709442 - EPA 3050B										
Blank (1709442-BLK1)				Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	ND	0.25	mg/kg							
Arsenic	ND	0.10	"							
LCS (1709442-BS1)				Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	9.34	0.25	mg/kg	10.0		93	75-125			
Arsenic	9.44	0.10	"	10.0		94	75-125			
Matrix Spike (1709442-MS1)		**Source: 17L0349-01**		Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	24.5	2.5	mg/kg	10.0	15.8	87	75-125			
Arsenic	11.5	1.0	"	10.0	2.72	88	75-125			
Matrix Spike Dup (1709442-MSD1)		**Source: 17L0349-01**		Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	26.0	2.5	mg/kg	10.0	15.8	102	75-125	6	30	
Arsenic	12.3	1.0	"	10.0	2.72	95	75-125	7	30	
Batch 1709443 - EPA 3050B										
Blank (1709443-BLK1)				Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	ND	0.25	mg/kg							
Arsenic	ND	0.10	"							
LCS (1709443-BS1)				Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	9.36	0.25	mg/kg	10.0		94	75-125			
Arsenic	9.53	0.10	"	10.0		95	75-125			
Matrix Spike (1709443-MS1)		**Source: 17L0349-22**		Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	14.0	2.5	mg/kg	10.0	5.32	87	75-125			
Arsenic	17.3	1.0	"	10.0	6.26	110	75-125			

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709443 - EPA 3050B										
Matrix Spike Dup (1709443-MSD1)		**Source: 17L0349-22**		Prepared: 12/09/17 Analyzed: 12/11/17						
Lead	30.0	2.5	mg/kg	10.0	5.32	247	75-125	73	30	QM-5
Arsenic	15.2	1.0	"	10.0	6.26	90	75-125	13	30	
Batch 1709446 - EPA 3050B										
Blank (1709446-BLK1)				Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	ND	0.25	mg/kg							
Arsenic	ND	0.10	"							
LCS (1709446-BS1)				Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	10.5	0.25	mg/kg	10.0		105	75-125			
Arsenic	8.34	0.10	"	10.0		83	75-125			
Matrix Spike (1709446-MS1)		**Source: 17L0310-71**		Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	20.5	2.5	mg/kg	10.0	9.86	106	75-125			
Arsenic	16.2	1.0	"	10.0	7.36	88	75-125			
Matrix Spike Dup (1709446-MSD1)		**Source: 17L0310-71**		Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	20.3	2.5	mg/kg	10.0	9.86	105	75-125	0.7	30	
Arsenic	16.5	1.0	"	10.0	7.36	91	75-125	2	30	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0349**
irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 184190, 184191, 184193, 184194

Notes and Definitions

QM-5	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
ICP/MS	It was run by ICP/MS (EPA method 200.8/6020).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

December 15, 2017

CLS Work Order #: 17L0358
COC #:

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Ste 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 12/08/17 11:55. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.: 17L0358-1

LOG № 185985

REPORT TO:

NAME AND ADDRESS: Kleinfelder, 2 Ada St. 250, Irvine, CA

PROJECT MANAGER: Paolo Dicon

PHONE #

PROJECT NAME: Costco Loomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION

SITE LOCATION

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY

☒ CLS (916) 638-7301, 3249 FITZGERALD RD., RANCHO CORDOVA, CA 95742

☐ OTHER

GEOTRACKER:

EDF REPORT ☐ YES ☐ NO

GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

INVOICE TO:

PO. #

QUOTE #

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	PRESERVATIVES	ANALYSIS REQUESTED: Arsenic and Lead 6010B
12-08-17	0820	SB-21-0.5	Soil	1	Jar		X
	0825	SB-21-3					X
	0830	SB-19-0.5					X
	0835	SB-19-3					X
	0840	SB-23-0.5					X
	0845	SB-23-3					X
	0850	SB-24-0.5					X
	0855	SB-24-3					X
	0900	SB-34-0.5					X
	0905	SB-34-3					X
	0910	SB-32-3					X
	0915	SB-35-0.5					X
	0920	SB-35-3					X

SUSPECTED CONSTITUENTS

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
	Brandon Connelly / KLF	12-08-17 / 1155		

REC'D AT LAB BY

DATE / TIME: 12-8-17 1155 (1.7)

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☐ OTHER

AIR BILL #

Gold-Project Mgr./Field Sampler/Terms and conditions

Pink- Origin/Terms and Conditions

Yellow- Lab file copy/Terms and Conditions

White-Lab/Terms and conditions

2 of 2

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.: 712058-2 LOG № 185986

REPORT TO:

NAME AND ADDRESS: Klein Fedder, 2 Ada Suite 250, Irvine, CA

PROJECT MANAGER: Paolo Dizon PHONE#

PROJECT NAME: Costco Coom 15

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION

SITE LOCATION

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY

☒ CLS (916) 638-7301, 3249 FITZGERALD RD, RANCHO CORDOVA, CA 95742

☐ OTHER

GEOTRACKER:

EDF REPORT ☐ YES ☐ NO

GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	PRESERVATIVES	ANALYSIS REQUESTED: Arsenic and Lead 6010B	1 DAY	2 DAY	3 DAY	5 DAY
12-08-17	0925	SB-33-0.5	Soil	1	Jar		X				X
	0930	SB-33-3					X				
	0935	SB-31-0.5					X				
	0940	SB-31-3					X				
	0945	SB-30-0.5					X				
	0950	SB-30-3					X				
	0955	SB-29-0.5					X				
	1000	SB-29-3					X				
	1005	SB-28-0.5					X				
	1010	SB-28-3					X				
	1015	SB-27-0.5					X				
	1020	SB-27-3					X				
					5C	12-08-17					

INVOICE TO:

P.O. #

QUOTE #

SUSPECTED CONSTITUENTS

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
	Brandon Connelly / KCF	12-08-17 1155		

REC'D AT LAB BY: DATE / TIME: 12/8/17 1155 (17)

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☐ OTHER

AIR BILL #

Gold-Project Mgr./Field Sampler/Terms and conditions

Pink- Origin/Terms and Conditions

Yellow- Lab file copy/Terms and Conditions

White-Lab/Terms and conditions

CALIFORNIA LABORATORY SERVICES

 12/15/17 09:30

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-21-0.5 (17L0358-01) Soil Sampled: 12/08/17 08:20 Received: 12/08/17 11:55									
Arsenic	**7.0**	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**28**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-21-3 (17L0358-02) Soil Sampled: 12/08/17 08:25 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-19-0.5 (17L0358-03) Soil Sampled: 12/08/17 08:30 Received: 12/08/17 11:55									
Arsenic	**17**	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**90**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-19-3 (17L0358-04) Soil Sampled: 12/08/17 08:35 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-23-0.5 (17L0358-05) Soil Sampled: 12/08/17 08:40 Received: 12/08/17 11:55									
Arsenic	**2.5**	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**10**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-23-3 (17L0358-06) Soil Sampled: 12/08/17 08:45 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-24-0.5 (17L0358-07) Soil Sampled: 12/08/17 08:50 Received: 12/08/17 11:55									
Arsenic	**19**	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**58**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/15/17 09:30

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-24-3 (17L0358-08) Soil Sampled: 12/08/17 08:55 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-34-0.5 (17L0358-09) Soil Sampled: 12/08/17 09:00 Received: 12/08/17 11:55									
Arsenic	**19**	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**84**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-34-3 (17L0358-10) Soil Sampled: 12/08/17 09:05 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-32-3 (17L0358-11) Soil Sampled: 12/08/17 09:10 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709446	12/09/17	12/14/17	EPA 6020	
Lead	**2.6**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-35-0.5 (17L0358-12) Soil Sampled: 12/08/17 09:15 Received: 12/08/17 11:55									
Arsenic	**4.6**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**20**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-35-3 (17L0358-13) Soil Sampled: 12/08/17 09:20 Received: 12/08/17 11:55									
Arsenic	**3.8**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**17**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-33-0.5 (17L0358-14) Soil Sampled: 12/08/17 09:25 Received: 12/08/17 11:55									
Arsenic	**14**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**8.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/15/17 09:30

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-33-3 (17L0358-15) Soil Sampled: 12/08/17 09:30 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-31-0.5 (17L0358-16) Soil Sampled: 12/08/17 09:35 Received: 12/08/17 11:55									
Arsenic	**5.7**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**22**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-31-3 (17L0358-17) Soil Sampled: 12/08/17 09:40 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**2.8**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-30-0.5 (17L0358-18) Soil Sampled: 12/08/17 09:45 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**5.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-30-3 (17L0358-19) Soil Sampled: 12/08/17 09:50 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-29-0.5 (17L0358-20) Soil Sampled: 12/08/17 09:55 Received: 12/08/17 11:55									
Arsenic	**20**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**95**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-29-3 (17L0358-21) Soil Sampled: 12/08/17 10:00 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**3.2**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/15/17 09:30

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-28-0.5 (17L0358-22) Soil Sampled: 12/08/17 10:05 Received: 12/08/17 11:55									
Arsenic	**7.4**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**39**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-28-3 (17L0358-23) Soil Sampled: 12/08/17 10:10 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-27-0.5 (17L0358-24) Soil Sampled: 12/08/17 10:15 Received: 12/08/17 11:55									
Arsenic	**18**	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	**82**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-27-3 (17L0358-25) Soil Sampled: 12/08/17 10:20 Received: 12/08/17 11:55									
Arsenic	ND	1.0	mg/kg	10	1709455	12/11/17	12/14/17	EPA 6020	
Lead	ND	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/15/17 09:30

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709446 - EPA 3050B										
Blank (1709446-BLK1)				Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	ND	0.25	mg/kg							
Arsenic	ND	0.10	"							
LCS (1709446-BS1)				Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	10.5	0.25	mg/kg	10.0		105	75-125			
Arsenic	8.34	0.10	"	10.0		83	75-125			
Matrix Spike (1709446-MS1)		**Source: 17L0310-71**		Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	20.5	2.5	mg/kg	10.0	9.86	106	75-125			
Arsenic	16.2	1.0	"	10.0	7.36	88	75-125			
Matrix Spike Dup (1709446-MSD1)		**Source: 17L0310-71**		Prepared: 12/09/17 Analyzed: 12/13/17						
Lead	20.3	2.5	mg/kg	10.0	9.86	105	75-125	0.7	30	
Arsenic	16.5	1.0	"	10.0	7.36	91	75-125	2	30	
Batch 1709455 - EPA 3050B										
Blank (1709455-BLK1)				Prepared: 12/11/17 Analyzed: 12/14/17						
Lead	ND	0.25	mg/kg							
Arsenic	ND	0.10	"							
LCS (1709455-BS1)				Prepared: 12/11/17 Analyzed: 12/14/17						
Lead	9.66	0.25	mg/kg	10.0		97	75-125			
Arsenic	9.06	0.10	"	10.0		91	75-125			
Matrix Spike (1709455-MS1)		**Source: 17L0358-12**		Prepared: 12/11/17 Analyzed: 12/14/17						
Lead	31.1	2.5	mg/kg	10.0	19.9	113	75-125			
Arsenic	13.6	1.0	"	10.0	4.56	90	75-125			

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709455 - EPA 3050B										
Matrix Spike Dup (1709455-MSD1)		**Source: 17L0358-12**		Prepared: 12/11/17 Analyzed: 12/14/17						
Lead	31.8	2.5	mg/kg	10.0	19.9	119	75-125	2	30	
Arsenic	13.6	1.0	"	10.0	4.56	90	75-125	0.2	30	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0358**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #:

Notes and Definitions

ICP/MS	It was run by ICP/MS (EPA method 200.8/6020).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

December 21, 2017

CLS Work Order #: 17L0631
COC #: GREEN

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Ste 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 12/14/17 14:33. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

1710631

CHANGE OF STATUS

Work Order # 1710349

New Work Order ✓ Revise Existing Work Order _____

Project Name: Costco Loomis

Date Sample(s) Were Received: 12/7/17 Original Date 12/14/17

Paolo (Client Contacted) of Kleinfelder (Company) called/emailed

On 12/14/17 (Date) at 2:00 (Time)

... and requested the following:

Please perform STLC Lead on samples SB-12-0.5 - (05)
SB-08-0.5 - (07)
SB-07-0.5 - (13)

and STLC/TCLP Lead on sample SB-09-0.5 (21)

Turnaround time requested for additional work: 5

Julie Turner (Signature) 12/14/17 (Date)

Updated lab job database and file folder by: _____

Cc: _____ _____ _____

CALIFORNIA LABORATORY SERVICES

12/21/17 13:39

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0631**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-12-0.5 (17L0631-05) Soil Sampled: 12/07/17 08:55 Received: 12/14/17 14:33									
Lead	**2.1**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-08-0.5 (17L0631-07) Soil Sampled: 12/07/17 09:10 Received: 12/14/17 14:33									
Lead	**1.6**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-07-0.5 (17L0631-13) Soil Sampled: 12/07/17 09:45 Received: 12/14/17 14:33									
Lead	**2.2**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-09-0.5 (17L0631-21) Soil Sampled: 12/07/17 10:35 Received: 12/14/17 14:33									
Lead	**5.0**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

12/21/17 13:39

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0631**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

TCLP Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-09-0.5 (17L0631-21) Soil Sampled: 12/07/17 10:35 Received: 12/14/17 14:33									
Lead	ND	0.50	mg/L	1	1709727	12/19/17	12/20/17	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 12/21/17 13:39

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0631**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709726 - EPA 3010A										
Blank (1709726-BLK1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	ND	0.50	mg/L							
LCS (1709726-BS1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	57.6	0.50	mg/L	50.0		115	75-125			
Matrix Spike (1709726-MS1)		**Source: 17L0603-38**		Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	49.8	0.50	mg/L	50.0	1.15	97	75-125			
Matrix Spike Dup (1709726-MSD1)		**Source: 17L0603-38**		Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	52.1	0.50	mg/L	50.0	1.15	102	75-125	5	30	

CALIFORNIA LABORATORY SERVICES

 12/21/17 13:39

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0631**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

TCLP Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709727 - EPA 3010A TCLP										
Blank (1709727-BLK1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	ND	0.50	mg/L							
LCS (1709727-BS1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	58.4	0.50	mg/L	50.0		117	75-125			
Matrix Spike (1709727-MS1)		**Source: 17L0603-39**		Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	55.7	0.50	mg/L	50.0	ND	111	75-125			
Matrix Spike Dup (1709727-MSD1)		**Source: 17L0603-39**		Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	53.9	0.50	mg/L	50.0	ND	108	75-125	3	30	

CALIFORNIA LABORATORY SERVICES

12/21/17 13:39

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0631**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

December 22, 2017

CLS Work Order #: 17L0680
COC #: GREEN

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Ste 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 12/15/17 11:13. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

17L0480

CHANGE OF STATUS

Work Order # 17L0358

New Work Order ✓ Revise Existing Work Order _____

Project Name: Costco Loomis

Date Sample(s) Were Received: 12/8/17 Original Date 12/15/17

Sara (Client Contacted) of Kleinfelder (Company) called/emailed

On 12/15/17 (Date) at 10:45 (Time)

... and requested the following:

Please perform STLC Lead for

samples: SB-19-0.5 (03)
SB-24-0.5 (07)
SB-34-0.5 (09)
SB-29-0.5 (20)
SB-27-0.5 (24)

Turnaround time requested for additional work: 5

[signature] (Signature) 12/15/17 (Date)

Updated lab job database and file folder by: _____

Cc: _____

CALIFORNIA LABORATORY SERVICES

 12/22/17 16:19

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0680**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-19-0.5 (17L0680-03) Soil Sampled: 12/08/17 08:30 Received: 12/15/17 11:13									
Lead	**2.6**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-24-0.5 (17L0680-07) Soil Sampled: 12/08/17 08:50 Received: 12/15/17 11:13									
Lead	**2.0**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-34-0.5 (17L0680-09) Soil Sampled: 12/08/17 09:00 Received: 12/15/17 11:13									
Lead	**3.0**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-29-0.5 (17L0680-20) Soil Sampled: 12/08/17 09:55 Received: 12/15/17 11:13									
Lead	**4.4**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	
SB-27-0.5 (17L0680-24) Soil Sampled: 12/08/17 10:15 Received: 12/15/17 11:13									
Lead	**3.0**	0.50	mg/L	1	1709726	12/19/17	12/20/17	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 12/22/17 16:19

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0680**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709726 - EPA 3010A										
Blank (1709726-BLK1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	ND	0.50	mg/L							
LCS (1709726-BS1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	57.6	0.50	mg/L	50.0		115	75-125			
Matrix Spike (1709726-MS1)		**Source: 17L0603-38**		Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	49.8	0.50	mg/L	50.0	1.15	97	75-125			
Matrix Spike Dup (1709726-MSD1)		**Source: 17L0603-38**		Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	52.1	0.50	mg/L	50.0	1.15	102	75-125	5	30	

CALIFORNIA LABORATORY SERVICES

12/22/17 16:19

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0680**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

December 22, 2017

CLS Work Order #: 17L0706
COC #: 185988

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Ste 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 12/15/17 14:55. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CLS - Labs

CHAIN OF CUSTODY CLS ID No.: 17K0706 LOG № 185988

REPORT TO:

NAME AND ADDRESS: Kleinfelder
2 Ada St 250
Irvine, CA

PROJECT MANAGER: Sara Boyer, Paolo Dicon PHONE #

PROJECT NAME: Costco Loomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION:

SITE LOCATION:

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY:
☒ CLS (916) 638-7301
3249 FITZGERALD RD
RANCHO CORDOVA, CA
95742

☐ OTHER

PRESERVATIVES

ANALYSIS REQUESTED: Arsenic & lead, 6010B

GEOTRACKER:
EDF REPORT ☐ YES ☐ NO
GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS: Awesome

TURN AROUND TIME: 1 DAY, 2 DAY, 3 DAY, 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	Arsenic & lead, 6010B	1 DAY	2 DAY	3 DAY	5 DAY	ALT. ID
12.15.17	1100	SB-42-0.5	Soil	1	Sleeve	X				X	
	1105	SB-42-3				* H					HOLD
	1120	SB-43-0.5				X					
	1125	SB-43-3				* H					HOLD
	1110	SB-44-0.5				X					
	1115	SB-44-3				* H					HOLD
	1127	SB-45-0.5				X					
	1130	SB-45-3				* H					HOLD
	1135	SB-38-0.5				X					INVOICE TO:
	1140	SB-38-3				* H					HOLD
	1145	SB-39-0.5				X					
	1150	SB-39-3				* H					PO # HOLD
											QUOTE #

12.15.17

SUSPECTED CONSTITUENTS:

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
[signature]	Brandon Connelly / Kleinfelder	12-15-17 / 1455		

REC'D AT LAB BY: [signature]

DATE / TIME: 12-15-17 1455 (4.8)

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☐ OTHER

AIR BILL #

Gold-Project Mgr./Field Sampler/Terms and conditions
Pink- Origin/Terms and Conditions
Yellow- Lab file copy/Terms and Conditions
White-Lab/Terms and conditions

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.: 17L0706

LOG № 185987

REPORT TO:

NAME AND ADDRESS: Klinfelder
2 Ada St. 250
Irvine, CA

PROJECT MANAGER: Sara Boyer, Paul Dixon
PHONE#:

PROJECT NAME: Costco Loomis

SAMPLED BY: Brenda Cornelli

JOB DESCRIPTION:

SITE LOCATION:

CLIENT JOB NUMBER: 20172062

DESTINATION LABORATORY:

☒ CLS (916) 638-7301
3249 FITZGERALD RD.
RANCHO CORDOVA, CA.
95742

☐ OTHER

PRESERVATIVES

ANALYSIS REQUESTED: Arsenic & Lead 6010B

GEOTRACKER:
EDF REPORT ☐ YES ☐ NO
GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	Arsenic & Lead 6010B	5 DAY	SPECIAL INSTRUCTIONS
12-15-17	1155	SB-40-0.5	Soil	1	Sleeve	X	X	
	1200	SB-40-3				H		Hold
	1205	SB-36-0.5				X		
	1210	SB-36-3				H		Hold
	1215	SB-41-0.5				X		
	1220	SB-41-3				H		Hold
	1225	SB-37-0.5				X		
	1230	SB-37-3				H		Hold

12-15-17

INVOICE TO:

PO. #:

QUOTE #:

SUSPECTED CONSTITUENTS:

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
	Brenda Cornelli / Klinfelder	12-15-17/1455		

REC'D AT LAB BY: D. [illegible]

DATE / TIME: 12/15/17 1455 (4.8)

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☐ OTHER

AIR BILL #

Gold-Project Mgr./Field Sampler/Terms and conditions
Pink- Orig/s/Terms and Conditions
Yellow- Lab file copy/Terms and Conditions
White-Lab/Terms and conditions

CALIFORNIA LABORATORY SERVICES

 12/22/17 16:20

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0706**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-42-0.5 (17L0706-01) Soil Sampled: 12/15/17 11:00 Received: 12/15/17 14:55									
Arsenic	**2.6**	1.0	mg/kg	10	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**6.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-43-0.5 (17L0706-03) Soil Sampled: 12/15/17 11:20 Received: 12/15/17 14:55									
Arsenic	**15**	1.0	mg/kg	10	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**24**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-44-0.5 (17L0706-05) Soil Sampled: 12/15/17 11:10 Received: 12/15/17 14:55									
Arsenic	**2.7**	1.0	mg/kg	10	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**9.3**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-45-0.5 (17L0706-07) Soil Sampled: 12/15/17 11:27 Received: 12/15/17 14:55									
Arsenic	**2.7**	1.0	mg/kg	10	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**12**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-38-0.5 (17L0706-09) Soil Sampled: 12/15/17 11:35 Received: 12/15/17 14:55									
Arsenic	**16**	1.0	mg/kg	10	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**81**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-39-0.5 (17L0706-11) Soil Sampled: 12/15/17 11:45 Received: 12/15/17 14:55									
Arsenic	**19**	1.0	mg/kg	10	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**110**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-40-0.5 (17L0706-13) Soil Sampled: 12/15/17 11:55 Received: 12/15/17 14:55									
Arsenic	**14**	2.0	mg/kg	20	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**92**	5.0	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/22/17 16:20

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0706**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-36-0.5 (17L0706-15) Soil Sampled: 12/15/17 12:05 Received: 12/15/17 14:55									
Arsenic	**6.3**	2.0	mg/kg	20	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**68**	5.0	"	"	"	"	"	EPA 6010B	ICP/MS
SB-41-0.5 (17L0706-17) Soil Sampled: 12/15/17 12:15 Received: 12/15/17 14:55									
Arsenic	**8.7**	2.0	mg/kg	20	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**55**	5.0	"	"	"	"	"	EPA 6010B	ICP/MS
SB-37-0.5 (17L0706-19) Soil Sampled: 12/15/17 12:25 Received: 12/15/17 14:55									
Arsenic	**8.8**	5.0	mg/kg	100	1709718	12/19/17	12/20/17	EPA 6020	
Lead	**56**	25	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 12/22/17 16:20

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0706**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1709718 - EPA 3050B										
Blank (1709718-BLK1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	ND	0.25	mg/kg							
Arsenic	ND	0.10	"							
LCS (1709718-BS1)				Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	9.40	0.25	mg/kg	10.0		94	75-125			
Arsenic	8.61	0.10	"	10.0		86	75-125			
Matrix Spike (1709718-MS1)	**Source: 17L0706-01**			Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	16.7	2.5	mg/kg	10.0	6.74	99	75-125			
Arsenic	11.1	1.0	"	10.0	2.56	85	75-125			
Matrix Spike Dup (1709718-MSD1)	**Source: 17L0706-01**			Prepared: 12/19/17 Analyzed: 12/20/17						
Lead	17.1	2.5	mg/kg	10.0	6.74	103	75-125	2	30	
Arsenic	12.0	1.0	"	10.0	2.56	94	75-125	8	30	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 17L0706**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988

Notes and Definitions

ICP/MS	It was run by ICP/MS (EPA method 200.8/6020).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

January 09, 2018

CLS Work Order #: 18A0032
COC #: 185988 / GREEN

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Ste 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 01/02/18 11:30. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

19A0032

CHANGE OF STATUS

Work Order # 17L0706

New Work Order ✓ Revise Existing Work Order _____

Project Name: Costco Loomis

Date Sample(s) Were Received: 12/15/17 Original Date _____

Sara Bayer (Client Contacted) of Kleinfelder (Company) called/emailed

On 1/2/18 (Date) at 11:30 (Time)

... and requested the following:

Please perform STLC Lead on samples SB-38-0.5 (09)
SB-40-0.5 (13)
SB-36-0.5 (15)
SB-41-0.5 (17)
SB-37-0.5 (19)

and TCLP Lead on sample SB-39-0.5 (11)

Turnaround time requested for additional work: 5 day

(Signature) (Date) 1-2-18

Updated lab job database and file folder by: _____

Cc: _____ _____ _____

CALIFORNIA LABORATORY SERVICES

 01/09/18 15:12

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 18A0032**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988 / GREEN

STLC (WET) Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-38-0.5 (18A0032-09) Soil Sampled: 12/15/17 11:35 Received: 01/02/18 11:30									
Lead	**3.4**	0.50	mg/L	1	1800203	01/08/18	01/09/18	EPA 6010B	
SB-40-0.5 (18A0032-13) Soil Sampled: 12/15/17 11:55 Received: 01/02/18 11:30									
Lead	**1.3**	0.50	mg/L	1	1800203	01/08/18	01/09/18	EPA 6010B	
SB-36-0.5 (18A0032-15) Soil Sampled: 12/15/17 12:05 Received: 01/02/18 11:30									
Lead	**2.9**	0.50	mg/L	1	1800203	01/08/18	01/09/18	EPA 6010B	
SB-41-0.5 (18A0032-17) Soil Sampled: 12/15/17 12:15 Received: 01/02/18 11:30									
Lead	**2.4**	0.50	mg/L	1	1800203	01/08/18	01/09/18	EPA 6010B	
SB-37-0.5 (18A0032-19) Soil Sampled: 12/15/17 12:25 Received: 01/02/18 11:30									
Lead	**2.5**	0.50	mg/L	1	1800203	01/08/18	01/09/18	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 01/09/18 15:12

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 18A0032**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988 / GREEN

TCLP Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-39-0.5 (18A0032-11) Soil Sampled: 12/15/17 11:45 Received: 01/02/18 11:30									
Lead	ND	0.50	mg/L	1	1800205	01/08/18	01/09/18	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 01/09/18 15:12

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 18A0032**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988 / GREEN

STLC (WET) Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800203 - EPA 3010A										
Blank (1800203-BLK1)				Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	ND	0.50	mg/L							
LCS (1800203-BS1)				Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	47.9	0.50	mg/L	50.0		96	75-125			
Matrix Spike (1800203-MS1)		**Source: 18A0032-09**		Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	50.4	0.50	mg/L	50.0	3.38	94	75-125			
Matrix Spike Dup (1800203-MSD1)		**Source: 18A0032-09**		Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	52.2	0.50	mg/L	50.0	3.38	98	75-125	4	30	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 18A0032**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988 / GREEN

TCLP Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800205 - EPA 3010A TCLP										
Blank (1800205-BLK1)				Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	ND	0.50	mg/L							
LCS (1800205-BS1)				Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	53.6	0.50	mg/L	50.0		107	75-125			
Matrix Spike (1800205-MS1)		**Source: 18A0032-11**		Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	54.3	0.50	mg/L	50.0	0.313	108	75-125			
Matrix Spike Dup (1800205-MSD1)		**Source: 18A0032-11**		Prepared: 01/08/18 Analyzed: 01/09/18						
Lead	54.8	0.50	mg/L	50.0	0.313	109	75-125	0.9	30	

CALIFORNIA LABORATORY SERVICES

01/09/18 15:12

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Ste 250	Project Number: 20172062	**CLS Work Order #: 18A0032**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 185988 / GREEN

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

February 01, 2018

CLS Work Order #: 18A1386
COC #: 186169

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Stuite 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 01/25/18 15:30. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.: BA1386

LOG № 186169

REPORT TO:

NAME AND ADDRESS: Klein Felder, 2 Ada Smile 250, Irvine, CA

PROJECT MANAGER: Paolo Picon PHONE#: 949-727-4466

PROJECT NAME: Costco Coomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION:

SITE LOCATION: Coomis

CLIENT JOB NUMBER: 20172062.001A

DESTINATION LABORATORY:

☒ CLS (916) 638-7301, 3249 FITZGERALD RD., RANCHO CORDOVA, CA. 95742

☐ OTHER

GEOTRACKER: EDF REPORT ☐ YES ☐ NO

GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	Arsenic and Lead, 6010B	TPH-D, 8015B	VOCs + TPH-g, 8260B	Title 22 metals 6010B/7471	TPH-D, no 8015
01-25-18	1027	SB-59-0.5	Soil	1	Jar	X				
	1030	SB-59-3	↓	↓	↓	H				
	1045	SB-60-0.5	↓	↓	↓	X				
	1055	SB-60-3	↓	↓	↓	H				
	1200	GW-3	GW	2	VOA		X			
	1215	GW-2	↓	↓	↓		X			
	1230	GW-1	↓	↓	↓		X			
	1245	IDW	Soil	2	Jar			X	X	X

PRESERVATIVES

H = Hold

report on own SDG

INVOICE TO:

PO. #

QUOTE #

SUSPECTED CONSTITUENTS

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
[signature]	Brandon Connelly / CLF CLS	01-25-18/1445 1/25/18 1530	[signature]	CLS

RECD AT LAB BY: [signature] DATE / TIME: 12518 1539 CLS

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☑ OTHER

AIR BILL #

Gold-Project Mgr./Field Sampler/Terms and conditions

Pink- Origin/Terms and Conditions

Yellow- Lab file copy/Terms and Conditions

White-Lab/Terms and conditions

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GW-3 (18A1386-05) GW Sampled: 01/25/18 12:00 Received: 01/25/18 15:30									
Diesel	ND	0.050	mg/L	1	1800750	01/26/18	01/26/18	EPA 8015M	
Surrogate: o-Terphenyl		*90 %*	*65-135*		"	"	"	"	
GW-2 (18A1386-06) GW Sampled: 01/25/18 12:15 Received: 01/25/18 15:30									
Diesel	ND	0.050	mg/L	1	1800750	01/26/18	01/26/18	EPA 8015M	
Surrogate: o-Terphenyl		*86 %*	*65-135*		"	"	"	"	
GW-1 (18A1386-07) GW Sampled: 01/25/18 12:30 Received: 01/25/18 15:30									
Diesel	ND	0.050	mg/L	1	1800750	01/26/18	01/26/18	EPA 8015M	
Surrogate: o-Terphenyl		*88 %*	*65-135*		"	"	"	"	

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-59-0.5 (18A1386-01) Soil Sampled: 01/25/18 10:27 Received: 01/25/18 15:30									
Arsenic	ND	1.0	mg/kg	10	1800786	01/26/18	01/30/18	EPA 6020	
Lead	**2.7**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS
SB-60-0.5 (18A1386-03) Soil Sampled: 01/25/18 10:45 Received: 01/25/18 15:30									
Arsenic	**15**	1.0	mg/kg	10	1800786	01/26/18	01/30/18	EPA 6020	
Lead	**72**	2.5	"	"	"	"	"	EPA 6010B	ICP/MS

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800750 - EPA 3510B GCNV										
Blank (1800750-BLK1)				Prepared: 01/25/18 Analyzed: 01/26/18						
Diesel	ND	0.050	mg/L							
Motor Oil	ND	0.050	"							
Surrogate: o-Terphenyl	*0.0252*		*"*	*0.0250*		*101*	*65-135*			
LCS (1800750-BS1)				Prepared: 01/25/18 Analyzed: 01/26/18						
Diesel	2.18	0.050	mg/L	2.50		87	65-135			
Surrogate: o-Terphenyl	*0.0248*		*"*	*0.0250*		*99*	*65-135*			
LCS Dup (1800750-BSD1)				Prepared: 01/25/18 Analyzed: 01/26/18						
Diesel	2.19	0.050	mg/L	2.50		88	65-135	0.5	30	
Surrogate: o-Terphenyl	*0.0296*		*"*	*0.0250*		*118*	*65-135*			
Matrix Spike (1800750-MS1)		**Source: 18A1249-01**		Prepared: 01/25/18 Analyzed: 01/26/18						
Diesel	2.22	0.050	mg/L	2.50	ND	89	46-137			
Surrogate: o-Terphenyl	*0.0239*		*"*	*0.0250*		*96*	*65-135*			
Matrix Spike Dup (1800750-MSD1)		**Source: 18A1249-01**		Prepared: 01/25/18 Analyzed: 01/26/18						
Diesel	2.50	0.050	mg/L	2.50	ND	100	46-137	12	30	
Surrogate: o-Terphenyl	*0.0287*		*"*	*0.0250*		*115*	*65-135*			

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800786 - EPA 3050B										
Blank (1800786-BLK1)				Prepared: 01/26/18 Analyzed: 01/29/18						
Lead	ND	2.5	mg/kg							
Arsenic	ND	0.10	"							
LCS (1800786-BS1)				Prepared: 01/26/18 Analyzed: 01/29/18						
Lead	20.6	2.5	mg/kg	20.0		103	75-125			
Arsenic	15.6	0.10	"	20.0		78	75-125			
Matrix Spike (1800786-MS1)		**Source: 18A1379-11**		Prepared: 01/26/18 Analyzed: 01/29/18						
Lead	29.1	2.5	mg/kg	20.0	40.0	NR	75-125			QM-5
Arsenic	15.2	1.0	"	20.0	10.7	23	75-125			QM-5
Matrix Spike Dup (1800786-MSD1)		**Source: 18A1379-11**		Prepared: 01/26/18 Analyzed: 01/29/18						
Lead	42.7	2.5	mg/kg	20.0	40.0	14	75-125	38	30	QM-5
Arsenic	21.0	1.0	"	20.0	10.7	52	75-125	32	30	QM-5

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Notes and Definitions

QM-5	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
ICP/MS	It was run by ICP/MS (EPA method 200.8/6020).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

February 01, 2018

CLS Work Order #: 18A1386
COC #: 186169

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Stuite 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 01/25/18 15:30. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CLS - Labs

CHAIN OF CUSTODY

CLS ID No.: BA1386

LOG № 186169

REPORT TO:

NAME AND ADDRESS: Klein Felder, 2 Ada Smile 250, Irvine, CA

PROJECT MANAGER: Paolo Picon PHONE#: 949-727-4466

PROJECT NAME: Costco Coomis

SAMPLED BY: Brandon Connelly

JOB DESCRIPTION:

SITE LOCATION: Coomis

CLIENT JOB NUMBER: 20172062.001A

DESTINATION LABORATORY:

☒ CLS (916) 638-7301, 3249 FITZGERALD RD., RANCHO CORDOVA, CA. 95742

☐ OTHER

GEOTRACKER: EDF REPORT ☐ YES ☐ NO

GLOBAL ID:

COMPOSITE:

FIELD CONDITIONS:

TURN AROUND TIME: 1 DAY / 2 DAY / 3 DAY / 5 DAY

SPECIAL INSTRUCTIONS OR ALT. ID:

DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	CONTAINER TYPE	Arsenic and Lead, 6010B	TPH-D, 8015B	VOCs + TPH-g, 8260B	Title 22 metals 6010B/7471	TPH-D, no 8015
01-25-18	1027	SB-59-0.5	Soil	1	Jar	X				
	1030	SB-59-3	↓	↓	↓	H				
	1045	SB-60-0.5	↓	↓	↓	X				
	1055	SB-60-3	↓	↓	↓	H				
	1200	GW-3	GW	2	VOA		X			
	1215	GW-2	↓	↓	↓		X			
	1230	GW-1	↓	↓	↓		X			
	1245	IDW	Soil	2	Jar			X	X	X

PRESERVATIVES

H = Hold

report on own SDG

INVOICE TO:

PO. #

QUOTE #

SUSPECTED CONSTITUENTS

PRESERVATIVES: (1) HCL (2) HNO_3 (3) = COLD (4) = NaOH (5) = H_2SO_4 (6) = $Na_2S_2O_3$ (7) =

RELINQUISHED BY (SIGN)	PRINT NAME / COMPANY	DATE / TIME	RECEIVED BY (SIGN)	PRINT NAME / COMPANY
[signature]	Brandon Connelly / CLF CLS	01-25-18/1445 1/25/18 1530	[signature]	CLS

RECD AT LAB BY: [signature] DATE / TIME: 12518 1539 CLS

CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☑ OTHER

AIR BILL #

Gold-Project Mgr./Field Sampler/Terms and conditions

Pink- Origin/Terms and Conditions

Yellow- Lab file copy/Terms and Conditions

White-Lab/Terms and conditions

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:50

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

CAM 17 Metals

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IDW (18A1386-08) Soil Sampled: 01/25/18 12:45 Received: 01/25/18 15:30									
Antimony	ND	5.0	mg/kg	10	1800845	01/30/18	01/30/18	EPA 6020	
Arsenic	ND	2.0	"	"	"	"	"	"	
Barium	**240**	2.0	"	"	"	"	"	"	
Beryllium	ND	2.0	"	"	"	"	"	"	
Cadmium	ND	1.0	"	"	"	"	"	"	
Chromium	**37**	2.0	"	"	"	"	"	"	
Cobalt	**8.5**	2.0	"	"	"	"	"	"	
Copper	**38**	2.0	"	"	"	"	"	"	
Lead	ND	5.0	"	"	"	"	"	"	
Mercury	ND	0.10	"	1	1800861	01/30/18	01/30/18	EPA 7471A	
Molybdenum	ND	2.0	"	10	1800845	01/30/18	01/30/18	EPA 6020	
Nickel	**21**	2.0	"	"	"	"	"	"	
Selenium	ND	5.0	"	"	"	"	"	"	
Silver	ND	2.0	"	"	"	"	"	"	
Thallium	ND	2.0	"	"	"	"	"	"	
Vanadium	**53**	2.0	"	"	"	"	"	"	
Zinc	**42**	5.0	"	"	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:50

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Extractable Petroleum Hydrocarbons by EPA Method 8015M

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IDW (18A1386-08) Soil Sampled: 01/25/18 12:45 Received: 01/25/18 15:30									
Diesel	ND	1.0	mg/kg	1	1800812	01/29/18	01/29/18	EPA 8015M	
Motor Oil	ND	1.0	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*86 %*		*65-135*	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:50

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

TPH-Gasoline by GC/MS

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IDW (18A1386-08) Soil Sampled: 01/25/18 12:45 Received: 01/25/18 15:30									
Gasoline	ND	0.20	mg/kg	1	1800766	01/25/18	01/25/18	EPA 8260M	
Surrogate: Toluene-d8		*85 %*		*65-135*		"	"	"	"

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:50

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IDW (18A1386-08) Soil Sampled: 01/25/18 12:45 Received: 01/25/18 15:30									
1,1,1,2-Tetrachloroethane	ND	5.0	µg/kg	1	1800766	"	01/25/18	EPA 8260B	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	10	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2-Butanone	ND	100	"	"	"	"	"	"	
2-Hexanone	ND	50	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50	"	"	"	"	"	"	
Acetone	ND	100	"	"	"	"	"	"	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

 02/01/18 11:50

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IDW (18A1386-08) Soil Sampled: 01/25/18 12:45 Received: 01/25/18 15:30									
Bromoform	ND	5.0	µg/kg	1	1800766	"	01/25/18	EPA 8260B	
Bromomethane	ND	10	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	10	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane (Freon 12)	ND	10	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Ethylbenzene	ND	5.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	20	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
o-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
p-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
tert-Amyl methyl ether	ND	5.0	"	"	"	"	"	"	
tert-Butyl alcohol	ND	50	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
IDW (18A1386-08) Soil Sampled: 01/25/18 12:45 Received: 01/25/18 15:30									
Toluene	ND	5.0	µg/kg	1	1800766	"	01/25/18	EPA 8260B	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	10	"	"	"	"	"	"	
Xylenes (total)	ND	10	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*123 %*		*50-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98 %*		*50-128*	"	"	"	"	
Surrogate: Toluene-d8		*85 %*		*62-125*	"	"	"	"	

CALIFORNIA LABORATORY SERVICES

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Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800845 - EPA 3050B										
Blank (1800845-BLK1)				Prepared & Analyzed: 01/30/18						
Beryllium	ND	0.20	mg/kg							
Cobalt	ND	0.20	"							
Vanadium	ND	0.20	"							
Chromium	ND	0.20	"							
Nickel	ND	0.20	"							
Copper	ND	0.20	"							
Zinc	ND	0.50	"							
Arsenic	ND	0.20	"							
Selenium	ND	0.50	"							
Silver	ND	0.20	"							
Molybdenum	ND	0.20	"							
Cadmium	ND	0.10	"							
Barium	ND	0.20	"							
Antimony	ND	0.50	"							
Thallium	ND	0.20	"							
Lead	ND	0.50	"							
LCS (1800845-BS1)				Prepared & Analyzed: 01/30/18						
Beryllium	1.77	0.20	mg/kg	2.00		88	75-125			
Cobalt	18.3	0.20	"	20.0		91	75-125			
Vanadium	18.6	0.20	"	20.0		93	75-125			
Chromium	18.1	0.20	"	20.0		91	75-125			
Nickel	18.2	0.20	"	20.0		91	75-125			
Copper	17.9	0.20	"	20.0		89	75-125			
Zinc	15.1	0.50	"	20.0		75	75-125			
Arsenic	17.2	0.20	"	20.0		86	75-125			
Selenium	16.9	0.50	"	20.0		85	75-125			
Silver	18.8	0.20	"	20.0		94	75-125			
Molybdenum	19.0	0.20	"	20.0		95	75-125			
Cadmium	1.83	0.10	"	2.00		91	75-125			
Barium	19.0	0.20	"	20.0		95	75-125			
Antimony	17.7	0.50	"	20.0		88	75-125			

CALIFORNIA LABORATORY SERVICES

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Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800845 - EPA 3050B										
LCS (1800845-BS1)				Prepared & Analyzed: 01/30/18						
Thallium	19.5	0.20	mg/kg	20.0		97	75-125			
Lead	19.5	0.50	"	20.0		97	75-125			
Matrix Spike (1800845-MS1)		**Source: 18A1452-01**		Prepared & Analyzed: 01/30/18						
Beryllium	2.44	2.0	mg/kg	2.00	0.540	95	75-125			
Cobalt	32.8	2.0	"	20.0	16.9	80	75-125			
Vanadium	77.8	2.0	"	20.0	54.8	115	75-125			
Chromium	60.8	2.0	"	20.0	43.7	86	75-125			
Nickel	54.1	2.0	"	20.0	39.0	76	75-125			
Copper	45.3	2.0	"	20.0	23.3	110	75-125			
Zinc	49.7	5.0	"	20.0	31.2	92	75-125			
Arsenic	17.6	2.0	"	20.0	2.58	75	75-125			
Selenium	15.7	5.0	"	20.0	1.21	72	75-125			QM-5
Silver	18.0	2.0	"	20.0	ND	90	75-125			
Molybdenum	8.50	2.0	"	20.0	1.51	35	75-125			QM-5
Cadmium	3.21	1.0	"	2.00	0.870	117	75-125			
Barium	100	2.0	"	20.0	69.5	154	75-125			QM-4X
Antimony	0.660	5.0	"	20.0	0.650	0.05	75-125			QM-5
Thallium	19.2	2.0	"	20.0	0.110	95	75-125			
Lead	24.9	5.0	"	20.0	5.16	99	75-125			
Matrix Spike Dup (1800845-MSD1)		**Source: 18A1452-01**		Prepared & Analyzed: 01/30/18						
Beryllium	2.55	2.0	mg/kg	2.00	0.540	101	75-125	4	30	
Cobalt	30.9	2.0	"	20.0	16.9	70	75-125	6	30	QM-5
Vanadium	70.1	2.0	"	20.0	54.8	76	75-125	10	30	
Chromium	60.0	2.0	"	20.0	43.7	82	75-125	1	30	
Nickel	50.8	2.0	"	20.0	39.0	59	75-125	6	30	QM-5
Copper	40.0	2.0	"	20.0	23.3	83	75-125	13	30	
Zinc	51.9	5.0	"	20.0	31.2	103	75-125	4	30	
Arsenic	18.2	2.0	"	20.0	2.58	78	75-125	3	30	
Selenium	16.2	5.0	"	20.0	1.21	75	75-125	3	30	
Silver	18.0	2.0	"	20.0	ND	90	75-125	0.2	30	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

CAM 17 Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800845 - EPA 3050B										
Matrix Spike Dup (1800845-MSD1)		**Source: 18A1452-01**		Prepared & Analyzed: 01/30/18						
Molybdenum	9.16	2.0	mg/kg	20.0	1.51	38	75-125	7	30	QM-5
Cadmium	2.70	1.0	"	2.00	0.870	92	75-125	17	30	
Barium	97.4	2.0	"	20.0	69.5	140	75-125	3	30	QM-4X
Antimony	0.510	5.0	"	20.0	0.650	NR	75-125	26	30	QM-5
Thallium	19.1	2.0	"	20.0	0.110	95	75-125	0.4	30	
Lead	25.0	5.0	"	20.0	5.16	99	75-125	0.2	30	
Batch 1800861 - EPA 7471A										
Blank (1800861-BLK1)				Prepared & Analyzed: 01/30/18						
Mercury	ND	0.10	mg/kg							
LCS (1800861-BS1)				Prepared & Analyzed: 01/30/18						
Mercury	0.192	0.10	mg/kg	0.208		92	75-125			
Matrix Spike (1800861-MS1)		**Source: 18A1464-01**		Prepared & Analyzed: 01/30/18						
Mercury	0.218	0.10	mg/kg	0.208	0.0315	90	75-125			
Matrix Spike Dup (1800861-MSD1)		**Source: 18A1464-01**		Prepared & Analyzed: 01/30/18						
Mercury	0.251	0.10	mg/kg	0.208	0.0315	106	75-125	14	25	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Extractable Petroleum Hydrocarbons by EPA Method 8015M - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800812 - EPA 3510B GCNV										
Blank (1800812-BLK1)				Prepared & Analyzed: 01/29/18						
Diesel	ND	1.0	mg/kg							
Motor Oil	ND	1.0	"							
Surrogate: o-Terphenyl	*0.505*		*"*	*0.500*		*101*	*65-135*			
LCS (1800812-BS1)				Prepared & Analyzed: 01/29/18						
Diesel	48.1	1.0	mg/kg	50.0		96	65-135			
Surrogate: o-Terphenyl	*0.510*		*"*	*0.500*		*102*	*65-135*			
LCS Dup (1800812-BSD1)				Prepared & Analyzed: 01/29/18						
Diesel	44.8	1.0	mg/kg	50.0		90	65-135	7	30	
Surrogate: o-Terphenyl	*0.521*		*"*	*0.500*		*104*	*65-135*			
Matrix Spike (1800812-MS1)		**Source: 18A1386-08**		Prepared & Analyzed: 01/29/18						
Diesel	46.3	1.0	mg/kg	50.0	ND	93	59-138			
Surrogate: o-Terphenyl	*0.450*		*"*	*0.500*		*90*	*65-135*			
Matrix Spike Dup (1800812-MSD1)		**Source: 18A1386-08**		Prepared & Analyzed: 01/29/18						
Diesel	46.2	1.0	mg/kg	50.0	ND	92	59-138	0.3	37	
Surrogate: o-Terphenyl	*0.422*		*"*	*0.500*		*84*	*65-135*			

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

TPH-Gasoline by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800766 - EPA 5030 Soil MS										
Blank (1800766-BLK1)				Prepared & Analyzed: 01/25/18						
Gasoline	ND	0.20	mg/kg							
Surrogate: Toluene-d8	*0.0262*		*"*	*0.0300*		*87*	*65-135*			
LCS (1800766-BS1)				Prepared & Analyzed: 01/25/18						
Gasoline	2.23	0.20	mg/kg	2.00		112	65-135			
Surrogate: Toluene-d8	*0.0263*		*"*	*0.0300*		*88*	*65-135*			
LCS Dup (1800766-BSD1)				Prepared & Analyzed: 01/25/18						
Gasoline	2.32	0.20	mg/kg	2.00		116	65-135	4	30	
Surrogate: Toluene-d8	*0.0257*		*"*	*0.0300*		*86*	*65-135*			
Matrix Spike (1800766-MS1)		**Source: 18A1325-01**		Prepared & Analyzed: 01/25/18						
Gasoline	2.20	0.20	mg/kg	2.00	ND	110	63-124			
Surrogate: Toluene-d8	*0.0259*		*"*	*0.0300*		*86*	*65-135*			
Matrix Spike Dup (1800766-MSD1)		**Source: 18A1325-01**		Prepared & Analyzed: 01/25/18						
Gasoline	2.15	0.20	mg/kg	2.00	ND	108	63-124	2	35	
Surrogate: Toluene-d8	*0.0251*		*"*	*0.0300*		*84*	*65-135*			

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800766 - EPA 5030 Soil MS										
Blank (1800766-BLK1)				Prepared & Analyzed: 01/25/18						
Acetone	ND	100	µg/kg							
Benzene	ND	5.0	"							
Bromobenzene	ND	5.0	"							
Bromochloromethane	ND	5.0	"							
Bromodichloromethane	ND	5.0	"							
Bromoform	ND	5.0	"							
Bromomethane	ND	10	"							
2-Butanone	ND	100	"							
n-Butylbenzene	ND	5.0	"							
sec-Butylbenzene	ND	5.0	"							
tert-Butylbenzene	ND	5.0	"							
Carbon tetrachloride	ND	5.0	"							
Chlorobenzene	ND	5.0	"							
Chloroethane	ND	5.0	"							
Chloroform	ND	5.0	"							
Chloromethane	ND	10	"							
o-Chlorotoluene	ND	5.0	"							
p-Chlorotoluene	ND	5.0	"							
Dibromochloromethane	ND	5.0	"							
1,2-Dibromo-3-chloropropane	ND	10	"							
1,2-Dibromoethane (EDB)	ND	5.0	"							
Dibromomethane	ND	5.0	"							
1,2-Dichlorobenzene	ND	5.0	"							
1,3-Dichlorobenzene	ND	5.0	"							
1,4-Dichlorobenzene	ND	5.0	"							
Dichlorodifluoromethane (Freon 12)	ND	10	"							
1,1-Dichloroethane	ND	5.0	"							
1,2-Dichloroethane	ND	5.0	"							
1,1-Dichloroethene	ND	5.0	"							
cis-1,2-Dichloroethene	ND	5.0	"							
trans-1,2-Dichloroethene	ND	5.0	"							

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800766 - EPA 5030 Soil MS										
Blank (1800766-BLK1)				Prepared & Analyzed: 01/25/18						
1,2-Dichloropropane	ND	5.0	µg/kg							
1,3-Dichloropropane	ND	5.0	"							
2,2-Dichloropropane	ND	5.0	"							
1,1-Dichloropropene	ND	5.0	"							
cis-1,3-Dichloropropene	ND	5.0	"							
trans-1,3-Dichloropropene	ND	5.0	"							
Ethylbenzene	ND	5.0	"							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	5.0	"							
Hexachlorobutadiene	ND	5.0	"							
2-Hexanone	ND	50	"							
Isopropylbenzene	ND	5.0	"							
p-Isopropyltoluene	ND	5.0	"							
Methylene chloride	ND	20	"							
4-Methyl-2-pentanone	ND	50	"							
Methyl tert-butyl ether	ND	5.0	"							
Naphthalene	ND	5.0	"							
n-Propylbenzene	ND	5.0	"							
Styrene	ND	5.0	"							
1,1,2,2-Tetrachloroethane	ND	5.0	"							
1,1,1,2-Tetrachloroethane	ND	5.0	"							
Tetrachloroethene	ND	5.0	"							
Toluene	ND	5.0	"							
1,2,3-Trichlorobenzene	ND	5.0	"							
1,2,4-Trichlorobenzene	ND	5.0	"							
1,1,2-Trichloroethane	ND	5.0	"							
1,1,1-Trichloroethane	ND	5.0	"							
Trichloroethene	ND	5.0	"							
Trichlorofluoromethane	ND	5.0	"							
1,2,3-Trichloropropane	ND	5.0	"							
1,3,5-Trimethylbenzene	ND	5.0	"							
1,2,4-Trimethylbenzene	ND	5.0	"							

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800766 - EPA 5030 Soil MS										
Blank (1800766-BLK1)				Prepared & Analyzed: 01/25/18						
Vinyl chloride	ND	10	µg/kg							
Xylenes (total)	ND	10	"							
Di-isopropyl ether	ND	5.0	"							
Ethyl tert-butyl ether	ND	5.0	"							
tert-Amyl methyl ether	ND	5.0	"							
tert-Butyl alcohol	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	*32.8*		*"*	*30.0*		*109*	*50-125*			
Surrogate: Toluene-d8	*26.2*		*"*	*30.0*		*87*	*62-125*			
Surrogate: 4-Bromofluorobenzene	*31.5*		*"*	*30.0*		*105*	*50-128*			
LCS (1800766-BS1)				Prepared & Analyzed: 01/25/18						
Benzene	18.4	5.0	µg/kg	20.0		92	64-135			
Chlorobenzene	17.5	5.0	"	20.0		88	67-133			
1,1-Dichloroethene	19.5	5.0	"	20.0		98	53-137			
Toluene	17.1	5.0	"	20.0		86	61-138			
Trichloroethene	17.6	5.0	"	20.0		88	64-130			
Surrogate: 1,2-Dichloroethane-d4	*27.4*		*"*	*30.0*		*91*	*50-125*			
Surrogate: Toluene-d8	*31.2*		*"*	*30.0*		*104*	*62-125*			
Surrogate: 4-Bromofluorobenzene	*28.7*		*"*	*30.0*		*96*	*50-128*			
LCS Dup (1800766-BSD1)				Prepared & Analyzed: 01/25/18						
Benzene	19.1	5.0	µg/kg	20.0		96	64-135	4	30	
Chlorobenzene	16.6	5.0	"	20.0		83	67-133	6	30	
1,1-Dichloroethene	20.8	5.0	"	20.0		104	53-137	6	30	
Toluene	17.9	5.0	"	20.0		89	61-138	4	30	
Trichloroethene	17.8	5.0	"	20.0		89	64-130	1	30	
Surrogate: 1,2-Dichloroethane-d4	*29.2*		*"*	*30.0*		*97*	*50-125*			
Surrogate: Toluene-d8	*31.4*		*"*	*30.0*		*105*	*62-125*			
Surrogate: 4-Bromofluorobenzene	*28.2*		*"*	*30.0*		*94*	*50-128*			

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1800766 - EPA 5030 Soil MS										
Matrix Spike (1800766-MS1)		**Source: 18A1325-01**		Prepared & Analyzed: 01/25/18						
Benzene	17.8	5.0	µg/kg	20.0	ND	89	58-139			
Chlorobenzene	15.9	5.0	"	20.0	ND	79	62-134			
1,1-Dichloroethene	20.1	5.0	"	20.0	ND	100	53-152			
Toluene	16.6	5.0	"	20.0	ND	83	58-139			
Trichloroethene	18.6	5.0	"	20.0	ND	93	55-138			
Surrogate: 1,2-Dichloroethane-d4	*32.9*		*"*	*30.0*		*110*	*50-125*			
Surrogate: Toluene-d8	*32.6*		*"*	*30.0*		*109*	*62-125*			
Surrogate: 4-Bromofluorobenzene	*31.3*		*"*	*30.0*		*104*	*50-128*			
Matrix Spike Dup (1800766-MSD1)		**Source: 18A1325-01**		Prepared & Analyzed: 01/25/18						
Benzene	18.1	5.0	µg/kg	20.0	ND	90	58-139	2	30	
Chlorobenzene	15.5	5.0	"	20.0	ND	77	62-134	3	30	
1,1-Dichloroethene	18.9	5.0	"	20.0	ND	95	53-152	6	30	
Toluene	16.4	5.0	"	20.0	ND	82	58-139	1	30	
Trichloroethene	19.6	5.0	"	20.0	ND	98	55-138	5	30	
Surrogate: 1,2-Dichloroethane-d4	*30.3*		*"*	*30.0*		*101*	*50-125*			
Surrogate: Toluene-d8	*33.6*		*"*	*30.0*		*112*	*62-125*			
Surrogate: 4-Bromofluorobenzene	*31.2*		*"*	*30.0*		*104*	*50-128*			

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18A1386**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: 186169

Notes and Definitions

QM-5	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

February 09, 2018

CLS Work Order #: 18B0099
COC #: GREEN

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Stuite 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 02/02/18 08:32. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

18B0099

CHANGE OF STATUS

Work Order # 18A1579

New Work Order ✓ Revise Existing Work Order _____

Project Name: COSTCO LOOMIS

Date Sample(s) Were Received: 1/25/18 Original Date 2/1/18

SANA BOYEL (Client Contacted) of KLEINFELDER (Company) called/emailed

On 2/1/18 (Date) at 1650 hrs (Time) (EMAIL)

... and requested the following:

Run LEAD STLC on samples:

-01 (SB-50-0.5)
-03 (SB-48-0.5)
-13 (SB-51-0.5)
-25 (SB-58-0.5)

Run STLC-LEAD & TCLP-LEAD on Samples:

-07 (SB-49-0.5)
-15 (SB-56-0.5)

Turnaround time requested for additional work: 5

(Signature) 2/2/18 (Date)

Updated lab job database and file folder by: _____

Cc: _____ _____ _____

CALIFORNIA LABORATORY SERVICES

 02/09/18 13:47

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0099**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-50-0.5 (18B0099-01) Soil Sampled: 01/25/18 08:20 Received: 02/02/18 08:32									
Lead	**1.7**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	
SB-48-0.5 (18B0099-03) Soil Sampled: 01/25/18 08:30 Received: 02/02/18 08:32									
Lead	**1.7**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	
SB-49-0.5 (18B0099-07) Soil Sampled: 01/25/18 08:47 Received: 02/02/18 08:32									
Lead	**1.5**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	
SB-51-0.5 (18B0099-13) Soil Sampled: 01/25/18 09:12 Received: 02/02/18 08:32									
Lead	**0.93**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	
SB-56-0.5 (18B0099-15) Soil Sampled: 01/25/18 09:20 Received: 02/02/18 08:32									
Lead	**3.0**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	
SB-58-0.5 (18B0099-25) Soil Sampled: 01/25/18 10:20 Received: 02/02/18 08:32									
Lead	**1.2**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 02/09/18 13:47

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0099**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

TCLP Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-49-0.5 (18B0099-07) Soil Sampled: 01/25/18 08:47 Received: 02/02/18 08:32									
Lead	ND	0.50	mg/L	1	1801166	02/08/18	02/09/18	EPA 6010B	
SB-56-0.5 (18B0099-15) Soil Sampled: 01/25/18 09:20 Received: 02/02/18 08:32									
Lead	ND	0.50	mg/L	1	1801166	02/08/18	02/09/18	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 02/09/18 13:47

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0099**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1801066 - EPA 3010A										
Blank (1801066-BLK1)				Prepared & Analyzed: 02/06/18						
Lead	ND	0.50	mg/L							
LCS (1801066-BS1)				Prepared & Analyzed: 02/06/18						
Lead	55.8	0.50	mg/L	50.0		112	75-125			
Matrix Spike (1801066-MS1)		**Source: 18B0006-01**		Prepared & Analyzed: 02/06/18						
Lead	48.3	0.50	mg/L	50.0	0.0877	96	75-125			
Matrix Spike Dup (1801066-MSD1)		**Source: 18B0006-01**		Prepared & Analyzed: 02/06/18						
Lead	48.2	0.50	mg/L	50.0	0.0877	96	75-125	0.2	30	

CALIFORNIA LABORATORY SERVICES

 02/09/18 13:47

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0099**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

TCLP Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1801166 - EPA 3010A										
Blank (1801166-BLK1)				Prepared: 02/08/18 Analyzed: 02/09/18						
Lead	ND	0.50	mg/L							
LCS (1801166-BS1)				Prepared: 02/08/18 Analyzed: 02/09/18						
Lead	53.8	0.50	mg/L	50.0		108	75-125			
Matrix Spike (1801166-MS1)		**Source: 18B0099-07**		Prepared: 02/08/18 Analyzed: 02/09/18						
Lead	51.3	0.50	mg/L	50.0	ND	103	75-125			
Matrix Spike Dup (1801166-MSD1)		**Source: 18B0099-07**		Prepared: 02/08/18 Analyzed: 02/09/18						
Lead	50.2	0.50	mg/L	50.0	ND	100	75-125	2	30	

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0099**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

CALIFORNIA LABORATORY SERVICES

3249 Fitzgerald Road Rancho Cordova, CA 95742

February 09, 2018

CLS Work Order #: 18B0100
COC #: GREEN

Paolo Dizon
Kleinfelder (Irvine)
2 Ada Stuite 250
Irvine, CA 92618

Project Name: Costco Loomis

Enclosed are the results of analyses for samples received by the laboratory on 02/02/18 08:47. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

18B0100

CHANGE OF STATUS

Work Order # 18A1386

New Work Order ✓ Revise Existing Work Order _____

Project Name: Costco Loomis

Date Sample(s) Were Received: 1/25/18 Original Date 2/1/18

Sara Boyer (Client Contacted) of Klein Fedor (Company) called/emailed

On 2/1/18 (Date) at 1646 (Time) (email)

... and requested the following:

Run STLC-LEAD on sample -03 (SB-60-0.5)

Turnaround time requested for additional work: 5

(Signature) 5 (Date)

Updated lab job database and file folder by: _____

Cc: _____ _____ _____

CALIFORNIA LABORATORY SERVICES

 02/09/18 13:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0100**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SB-60-0.5 (18B0100-03) Soil Sampled: 01/25/18 10:45 Received: 02/02/18 08:47									
Lead	**2.9**	0.50	mg/L	1	1801066	02/06/18	02/06/18	EPA 6010B	

CALIFORNIA LABORATORY SERVICES

 02/09/18 13:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0100**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

STLC (WET) Metals by 6000/7000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1801066 - EPA 3010A										
Blank (1801066-BLK1)				Prepared & Analyzed: 02/06/18						
Lead	ND	0.50	mg/L							
LCS (1801066-BS1)				Prepared & Analyzed: 02/06/18						
Lead	55.8	0.50	mg/L	50.0		112	75-125			
Matrix Spike (1801066-MS1)		**Source: 18B0006-01**		Prepared & Analyzed: 02/06/18						
Lead	48.3	0.50	mg/L	50.0	0.0877	96	75-125			
Matrix Spike Dup (1801066-MSD1)		**Source: 18B0006-01**		Prepared & Analyzed: 02/06/18						
Lead	48.2	0.50	mg/L	50.0	0.0877	96	75-125	0.2	30	

CALIFORNIA LABORATORY SERVICES

02/09/18 13:48

Kleinfelder (Irvine)	Project: Costco Loomis	
2 Ada Stuite 250	Project Number: 20172062.001A	**CLS Work Order #: 18B0100**
Irvine, CA 92618	Project Manager: Paolo Dizon	COC #: GREEN

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
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